Biodiversity Inventory of the Lakeview and Westbourne PFRA Community Pastures

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Executive Summary

Botanical inventories and bird point count surveys were completed in the Lakeview and Westbourne Community Pastures between June 12 and August 14, 2000. The adjacent pastures are located between the communities of Langruth and Plumas, in western Manitoba.

Methods for vegetation sampling followed the protocol provided by the Prairie Farm Rehabilitation Administration (PFRA), Agriculture and Agri-food Canada, to provide information on biodiversity within the pastures and to promote the conservation of native grasslands in Manitoba.

In the Lakeview pasture, twenty-seven vegetation transects were sampled in the three habitat types encountered: grassland; wetland; and woodland. Thirteen vegetation transects were sampled in the two habitat types encountered in the Westbourne pasture: grassland and wetland.

Thirty-one bird point count plots were surveyed in the entire study area, ten plots each for grassland and wetland habitats and eleven plots for woodland habitat. Seventy-four bird species were observed in the three habitat types found in the Lakeview pasture and thirty-four bird species were observed in two habitat types in the Westbourne pasture.

Overall 250 plant species and 81 bird species were observed during the study period in both pastures. Ten vascular plant species and eight bird species that are rare to uncommon for the province were recorded.

Cover Photographs from Lakeview Community Pasture:
Center: Native mixed-grass prairie, aspen woodland in background.
Top left: Butterfly from the family Satyrinae on meadow blazing star.
Top right: Bald eagle from aspen woodland.
Bottom right: American goldfinch feeding on a thistle in native grass.
Bottom left: Horses grazing on native grassland.
All photos: Karin Newman.

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1. Introduction

Biodiversity surveys of the Lakeview and Westbourne Prairie Farm Rehabilitation Administration (PFRA) Community Pastures were completed in the summer of 2000. The two adjacent pastures are located directly south of Big Grass Marsh, between the communities of Langruth and Plumas. The area is characterized by a ridge and swale topography with moderate to poorly developed trembling aspen (*Populus tremuloides*) woodland and grassland ridges. Small sloughs and low-lying areas dot the region.

The objectives of this project were to document the flora and avifauna occurring within the Community Pastures. The data provided by this study will be of value to the PFRA in the development of management plans and provide information towards the ongoing ecological monitoring of the pastures. Monitoring studies are a source of information on species biodiversity and are important to ensure sustainable livestock grazing of the pastures. Monitoring is critical for the ongoing conservation of native plant communities.

This study took place in June, July and August of 2000, with the floral and avifaunal surveys carried out between June 12 and August 14, 2000. Botanical studies were carried out by Karin Newman and Terry Mansell, and bird point count surveys were done by Dr. Robert Jones and Karin Newman. This report summarizes the findings of the vegetation and bird surveys.

2. Study Area

The Lakeview and Westbourne Community Pastures are directly adjacent to one another, separated by the main drainage ditch for Big Grass Marsh to the north. Both pastures fall within the Brandon Community Pasture District. Lakeview and Westbourne have different soil types resulting in different vegetation and habitat types. For the purposes of this report they will be discussed separately.

2.1. Location and Ecology

Both pastures fall within the Lake Manitoba Plain ecoregion, within the Prairie ecozone (Ecological Stratification Working Group 1995). The mean annual temperature is 2° C (16° C summer; -12.5° C winter). Mean annual precipitation ranges from 400-750mm. This ecoregion is typically low-relief and underlain by limestone bedrock and covered by extremely calcareous, broadly ridged glacial till. The landscape mosaic includes trembling aspen and shrubs on the moist sites and grass species growing on drier sites. Poorly drained sites are characterized by willow and sedge communities. This ecoregion is the transition between the boreal forest to the north, and the aspen parkland to the south.

2.1.1. Lakeview Community Pasture

The Lakeview Community Pasture is primarily located within Townships 15 and 16, Range 10W within the Rural Municipality (RM) of Lakeview, approximately 3 km west of the community of Langruth. Pasture headquarters are located at NE 23-16-10W. Refer to Figure 1 showing boundaries and detailed regional information.

Main access to the pasture is via Provincial Trunk Highway (PTH) 50 and Provincial Road (PR) 265. The PTH 50 runs near the east side of the pasture and comes within 1.6 km of pasture lands. PR 265 borders the north edge of Lakeview.

Main access points for the Lakeview pasture fields are:
(1) off PR 265 between sections 21 & 22-16-10W, leading to the central and south fields;
(2) off PR 265, a truck path at NW 20-16-10W provides access to the west fields of Lakeview;
(3) southeast access is gained from the south end of the pasture at the gate to SW 23-15-10W along the east/west range road at the south border of the pasture.

In 1998, both pastures were surveyed to determine the amount of brush, grassland and wetland. From this study, it was determined that approximately 19% of the Lakeview Pasture is covered in brush, moderately developed aspen/ poplar woodland, 13% of the pasture land is considered wetland and the remaining area is covered in grassland (Bowes 1998).

2.1.2. Westbourne Community Pasture

The Westbourne Community Pasture is located primarily within Townships 15 and 16, Range 11W, within the RM of Westbourne. Pasture headquarters are located at SW 16-16-11W.

Main access to the fields are gained via the corrals at SW 16-16-11W, near the pasture headquarters; access to fields north of PR 265 is gained from the road at SW 27-16-11W.

Wetland habitat accounts for 34% of the pasture. An estimated 1008 hectares have been seeded to reed canary grass (*Phalaris arundinaceae*) a moisture tolerant yet palatable grass species (Bowes 1998; PFRA unpub. data). There is no woodland habitat in the Westbourne pasture.

2.2. Pysiography, Hydrology and soils.

The Lakeview and Westbourne Community Pasture soils are covered by the West-Lake soil survey map area (Ehrlich *et al.* 1958). The underlying soils of the two pastures are different resulting in their slightly different habitats and ecology.

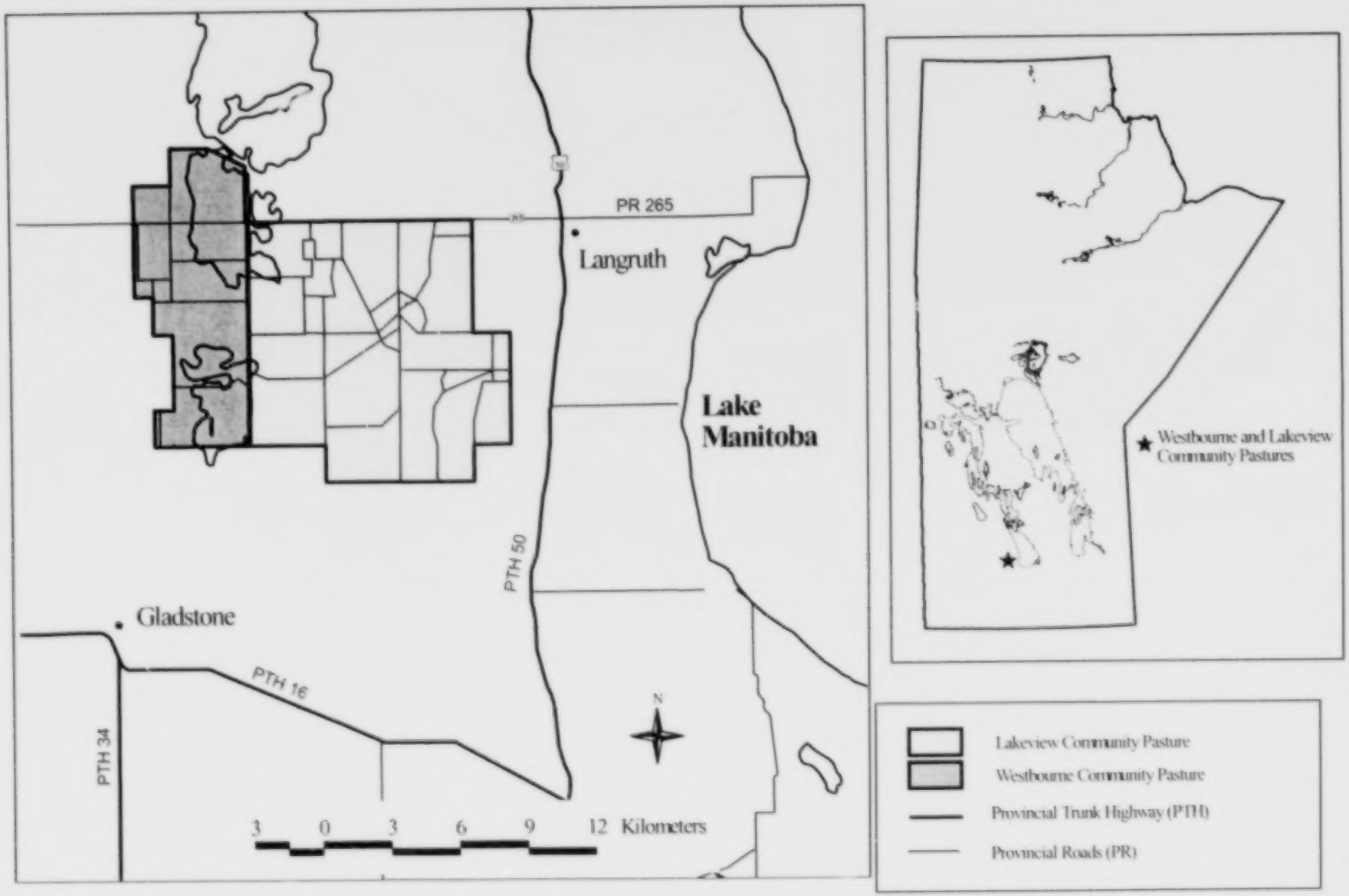

Figure 1. Locations of Westbourne and Lakeview Community Pastures within region (left) and province (right).

2.2.1 Lakeview Community Pasture

Lakeview Community Pasture soils fall into the Isafold Association; the dominant soil is a rendzina. The surface soil texture can vary between fine sandy loam to clay loam, with generally severe surface stoniness. Topography is nearly level to very gently sloping. The ridge and swale relief runs generally in a north-northwest to south-southeast direction. Surface run-off tends to accumulate in the swales resulting in many sloughs in the low lying areas. The ridges are imperfectly drained due to moderate to slow surface runoff and slow internal drainage.

2.2.2. Westbourne Community Pasture

Westbourne pasture soils are predominantly Lakeland Association, developed on lacustrine deposits. Surface texture soils are clay loam to silty clay loam. The topography is nearly level, with slow surface runoff and slow to moderate internal drainage. This region tends to have imperfect to poor drainage and the entire area is dotted with marsh and peaty marsh deposits.

Half bog organic soils cover the eastern portion of the Westbourne pasture. These soils consist of organic poorly drained peat deposits (30-65cm) occupying depressions often saturated with water throughout the growing season. Vegetation cover is dominated by reeds (*Juncas* spp.), sedges (*Carex* spp.) and some willow (*Salix* spp.).

2.3. History, Use and Management

The Westbourne pasture and a portion of the Lakeview pasture occur in an area previously covered by Big Grass Marsh, the drainage basin for the Riding Mountain portion of the Manitoba escarpment. The area around the marsh was not generally used for agriculture by early settlers, though they did hunt and trap the waterfowl and fur-bearers (muskrat) within the marsh.

In the early 1900s, the marsh was drained to reduce the frequent and serious flooding in the area and to create more land suitable for agriculture. Drainage of the marsh only temporarily reduced flooding and did not significantly increase the amount of arable land available; consequently, much of the privately owned land reverted to municipal ownership (Collins *et al.* 1977). The Lakeview and the Westbourne pastures occur on both municipal and provincial Crown land.

Brush encroachment can be a major concern on Community Pastures particularly within the transition area between the boreal forest and parkland ecoregions where Lakeview and Westbourne occur. Present day wildfire control and the loss of large roaming herds of bison contribute to the increase of woody plant expansion, beyond what would naturally and historically occur in this area.

Mechanical brush control techniques used by the PFRA include rotary mowers, roller-choppers or bark scrapers, depending on size and accessibility of the wooded areas. Herbicide may be effective in control of 1 to 2 year aspen suckers. Controlled grazing can also be used to reduce aspen suckering by repeated cattle browsing (Luciuk *et al.* 1999).

2.3.1. Lakeview Community Pasture

Lakeview Community Pasture is 11,754 hectares (29,044 ac), divided into 30 fields of various shapes, ranging from 32 ha (80 acres) to almost 1000 ha (2560 ac) in size (Bowes 1998). In the 2000 season, there were 2082 cattle and 330 horses on the Lakeview pasture (Agriculture and Agri-food Canada 2000).

PFRA brush management controls include a combination of fire, mechanical, herbicide and grazing (Luciuk *et al.* 1999). Fire is used to suppress juvenile and some mature aspen, preventing the occurrence of large blocks of mature aspen. Over half the fields on Lakeview have been burned to reduce aspen and birch encroachment.

Leafy spurge (*Euphorbia esula*) is a highly invasive and noxious weed. Occurrences of small pockets of leafy spurge are monitored and managed with biological and chemical controls. Beetle releases are practiced on some sites at the Lakeview pasture, with herbicide applications used on the smaller patches.

An inactive but intact cemetery is located in NW 28-15-10W. The fenced plots are extremely overgrown for lack of grazing. Several gravesites are still visible; the names on the headstones reflect the origins of some of the early settlers to the area.

2.3.2. Westbourne Community Pasture

The Westbourne Community Pasture is 5105 ha (12 614 ac) divided into 8 fields ranging from 16 ha (40 ac) to 1152 ha (2880 ac).). In the 2000 season, there were 1313 cattle grazing on the Westbourne pasture (Agriculture and Agri-food Canada 2000).

Almost half of the Westbourne pasture lands have been cleared or seeded. Over 1008 ha (2491 ac) in the pasture have been seeded to reed canary grass providing palatable cover in areas of extreme moisture. Two of the fields have been burned within the past four years to control brush (Bowes 1998).

3. Methods

3.1 Plants and Plant Communities

Methods for vegetation sampling on Lakeview and Westbourne pastures were based on protocol supplied by the PFRA for grassland and forested pastures. Sampling in both Community Pastures occurred between June 12 and August 18, 2000. Time spent in the pasture was divided between:

a) site selection;
b) sampling;
c) observations.

a) Site selection

The sampling protocol involved setting a transect in each habitat type (grassland, wetland or forested) observed in the pasture. All habitat types covering greater than 25% of the field area warranted vegetation sampling. Site selection was based on air photos and

maps of the study area and were verified with 1998 data for field cover classifications (Bowes 1998) as well as extensive ground explorations. Sampling occurred in areas representative of livestock use of the habitat and were 0.8 km from a stock water source. A total of 40 transects were sampled during the study period. Sampling on Lakeview pasture involved 27 transects in 17 of 30 fields; on Westbourne pasture 13 transects were sampled in 7 of 8 fields. Small holding fields near the corrals, fields not primarily or secondarily used by cattle and any field currently under cultivation were not sampled.

b) Sampling

All data were recorded using PFRA range inventory data forms with separate consideration of herbaceous and woody species (see Appendix I). All habitat types were sampled using ten quadrats placed at 20 m intervals along a 200 m transect. GPS readings were taken at the start and end point of each transect. Methods for data collection in grassland and wetland differed from those for woodland habitats.

i) Grassland and Wetland

Quadrat size for grassland and wetland transects was 20 cm x 50 cm. The percent biomass was estimated for each herbaceous species, occurring at >5% of the total biomass for all herbaceous cover, in each quadrat.

In addition, total herbaceous cover, bare ground, clubmoss and litter were recorded using modified Daubenmire cover classes (0 = 0; 1 = 0 - 1%; 2 = 1 - 5%; 3 = 5 - 25%; 4 = 25 - 50%; 5 = 50 - 75%; 6 = 75 - 95%; 8 = 95 - 100%). Refer to Appendix III and VI for summary of grassland transect data and Appendix IV and VII for wetland data.

ii) Forested

A larger quadrat size of 50 cm x 50 cm was used in wooded transects. Modified Daubenmire cover classes for total herbaceous cover, bare ground, litter, and moss/ lichen were recorded as in grassland and wetland habitat types. The percent cover of all herbaceous species with >5 % cover were noted. Woody species cover was assessed within a 10 m wide belt running the length of the transect (5 m on each side). Each woody species encountered along the transect was identified and recorded for its density distribution class (see Appendix I), median height, estimated height range and percent cover. Refer to Appendix V for forested data.

c) Observations

Species observed were recorded and/or collected for occurrence and phenology, along with field and habitat type of occurrence. Voucher specimens were collected for verification and future identification. General field notes were taken on the site ecology and livestock use of fields visited. Identification was carried out using Scoggan (1957), nomenclature follows Punter (1998).

3.2. Avifauna

Faunal sampling in the form of bird point count surveys were carried out between June 12 and July 14, 2000. The study involved:

a) site selection;
b) sampling;
c) observations.

a) Site selection

Sites were selected based on representation of major habitat types of the study area. Habitat assessment included the use of air photos, maps and ground surveys. The three major habitat types observed were i) grassland; ii) wetland; and iii) woodland. The local accessibility of particular pasture fields was also a factor influencing site selection.

b) Sampling

Point count surveys were used to determine bird species composition and relative abundance. For grass and wetland sites, circular plots of 100 m radius were used to determine the number of bird species present. Forested plots were 25-50 m in radius. Birds were identified by sound and sight observations, and their occurrence inside and/or outside the plot radius was recorded. A five-minute point count was taken from the center of each plot as early as one half hour before sunrise and no later than mid-morning. Point counts were conducted on dry days with low or no wind. The centers of each grassland and wetland plot were a minimum of 250m (150m for woodland) apart. All plots were surveyed twice, with two weeks between sampling dates.

c) Observations

Apart from formal bird point counts, general species observations were also recorded over the course of the study and throughout the area (Appendix XI).

4. Results

As per PFRA vegetation inventory protocol, numerous sites within the three main habitat types (grassland, wetland and forested) were sampled. Data are organized and presented in summary tables first by study area (pasture) and next by habitat type.

Three habitat types were recognized in the bird point count surveys. Ten plots were visited twice during the study in grass and wetland habitat types (eleven plots in forested areas). Both community pastures were considered as a single block of continuous space as birds observed at the boundary of the two pastures tended to move back and forth over this boundary. General species sightings are included with the point counts for each pasture and habitat type, though not by field. For lists of birds observed see Appendix VIII, Tables 23 (a)-(c) for Lakeview and Tables 24 (a)-(b) for Westbourne bird lists.

4.1. Lakeview Community Pasture

4.1.1. Grassland

A total of 17 grassland sites were visited in the Lakeview pasture with 159 plant species observed. As a measurement of habitat quality, grassland transects were classified into three general categories i) good, ii) moderate and iii) poor. To assess classification, the

cover values for herbaceous species, litter and bare ground were examined as well as the diversity of grassland species present. The number of native and non-native species observed were taken into consideration. General field notes made on the vigour and appearance of the grass growth and cattle disturbance for the transect specifically and the habitat type for the field in general were also included. Classification was based on the pasture condition at the time of sampling and estimation of the long-term use of the pasture was taken into consideration. Characteristics of the three conditions used for this study are based on the perspective of the study participants.

i) Good Condition

Characteristics of good grassland included a combination of a high number of native plant species, high herbaceous cover values, moderate litter values, low cover of bare ground and overall appearance of good condition. Classification was also partly based on a visual assessment and included characteristics such as even, erect growth of grass stems and relatively low levels of disturbance by cattle (e.g. trampling). Grassland transects within relatively good grassland habitats occurred in fields A1b; A2b; A2c; A2d; B2; B5; and B6.

Table 1. Summary of good condition grassland habitat, Lakeview Community Pasture.

Good Condition Grassland, Lakeview
Transects A1b; A2b; A2c; A2d; B2; B3a; B5; and B6.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
A combination of high number of species present and high herbaceous cover values, low bare ground values and appearance of good growth habit of grass species present; also based on a visual assessment of the area.
Herbaceous species
Typical species include Kentucky bluegrass (*Poa pratensis*), big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), switch grass (*Panicum virgatum*), slender wheatgrass (*Agropyron trachycaulum*), porcupine grass (*Stipa spartea*), beautiful sunflower (*Helianthus laetiflorus*), everlastings (*Antennaria* spp.), many-flowered aster (*Aster ericoides*).
Birds
37 species recorded for this habitat type. See Table 23 (a), Appendix VIII.
For further information
Refer to Tables 13 and 14, Appendix III; and Figures 3, 5, 7, and 8, Appendix IX.

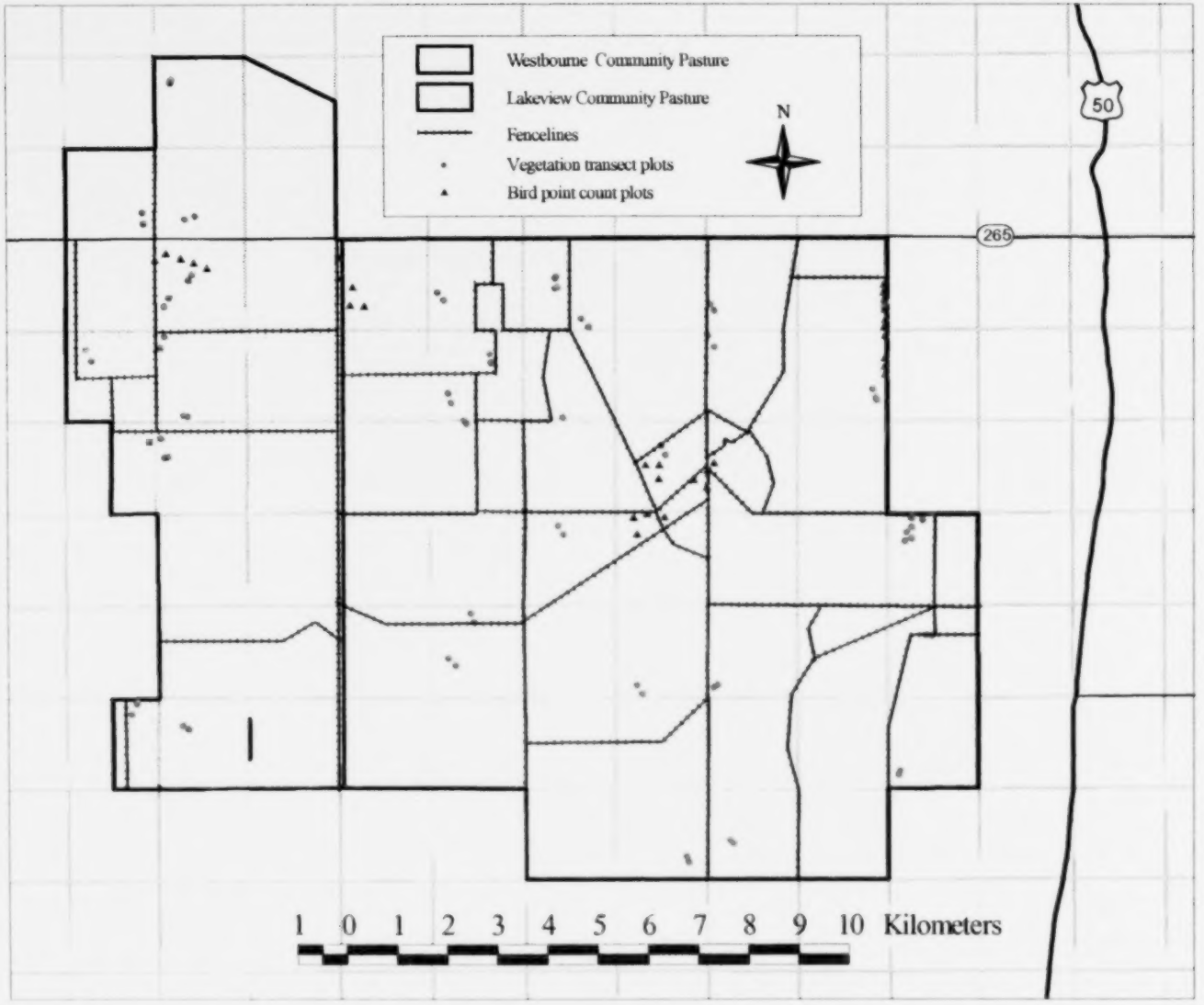

Figure 2. Westbourne and Lakeview Community Pastures showing vegetation transect and bird point count plots.

ii) Moderate Condition

The grasslands considered in moderate condition demonstrated characteristics between the good and poor conditions. See i) good condition above and iii) poor condition category below for characteristics. Grassland habitats assigned a moderate condition were sampled in fields A1; A1a; A2; A2a; and B1.

Table 2. Summary of moderate condition grassland habitat, Lakeview Community Pasture.

Moderate Condition Grassland, Lakeview
Transects A1; A1a; A2; A2a; and B1.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
An intermediary classification between good and poor condition, described above and below. Assessment is based on same factors of herbaceous and bare ground cover values, overall appearance of the condition of growth habit of species present and degree of cattle use and traffic in the area.
Herbaceous species
Typical species include slender wheatgrass, Kentucky bluegrass, redtop (*Agrostis stolonifera*), switch grass, big bluestem, little bluestem, spike rush (*Eleocharis* spp.), prairie sage (*Artemisia ludoviciana*), many-flowered aster, baltic rush (*Juncus balticus*).
Birds
No data collected specifically for this habitat type but are expected to be similar to the grassland data from Table 1 above.
For further information
Refer to Tables 13 and 14, Appendix III; and Figures 3, 4, 5, and 6, Appendix IX.

iii) Poor condition

An assignment of poor condition was based on a combination of a low number of species, low herbaceous cover (%) values, high bare ground cover (%) values, and appearance of poor condition as indicated by growth habit of the species present. Classification was partly based on a visual assessment and included characteristics such as sparse, spindly growth of grass stems and relatively high levels of disturbance by cattle such as trampling. These sites were often in high traffic areas either near water sources or in fields dominated by a wetland habitat type. Grassland habitats of poor condition were sampled in fields A1d; B1a; B8; and B8a.

Table 3. Summary of poor condition grassland habitat, Lakeview Community Pasture.

Poor Condition Grassland, Lakeview
Transects A1d; B1a; B8; and B8a.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
A combination of low number of species and low herbaceous cover values, high bare ground values and appearance of poor growth habit of grass species present or domination of forb species; based on a visual assessment of the area.
Herbaceous species
Typical species include Kentucky bluegrass, little bluestem, redtop, cord grass (*Spartina* spp.), sedge, thistle (*Cirsium* sp.) wild licorice (*Glycyrrhiza lepidota*), prairie sage, baltic rush.

Birds
No data collected specifically for this habitat type but are expected to be similar to the grassland data from Table 1 above.
Comments
These sites were often found near large sloughs or high traffic areas, so received more concentrated grazing due to general cattle preference for upland areas.
For further information
Refer to Tables 13 and 14, Appendix III; and Figures 3, 6, and 8, Appendix IX.

4.1.2. Wetland

Many sloughs of varying sizes were encountered throughout the Lakeview pasture. Wetland transects were sampled in five of the fields. A total of 55 plant species were observed in wetland transects on the Lakeview pasture. Sampling transects were placed along the marsh edges, and therefore may represent more marsh species tolerant to drier conditions. Edges tended to be dominated by sedges, bulrushes, spike rushes and moisture tolerant grasses, with generally low forb cover.

Grazing pressure was higher on nearby upland areas, though evidence of cattle grazing and use of water was apparent along the edges of many sloughs.

Table 4. Summary of wetland habitat, Lakeview Community Pasture.

Wetland, Lakeview
Transects A1a; B1; B6; B8; B8a.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
Slough edges and flooded grassland in low-lying areas of the pasture. Dominated by sedges, bulrush (*Scirpus* sp.) and wetland grass species.
Herbaceous species
Typical species present included reed grasses (*Calamagrostis* spp.), reed canary grass, smooth-fruited sedge (*Carex laeviconica*), bulrush, seaside arrow grass (*Triglochin maritima*), woundwort (*Stachys palustris*) and common mint (*Mentha arvensis*).
Birds
44 species were recorded for this habitat type. See Table 23 (b), Appendix VIII.
Comments
Wetland areas had lower grazing pressure than nearby upland areas.
For further information
Refer to Tables 15 and 16, Appendix IV; and Figures 4, 6, and 8, Appendix IX.

4.1.3. Forested

Woodland transects were sampled in five fields, with a total of 111 plant species recorded in this habitat type. The dominant tree species observed was trembling aspen; balsam poplar (*P. balsamifera*) co-dominated in older stands. Most wooded sites tended to have an open canopy, with a moderate shrub layer and very sparse herb layer. The occasional bur oak (*Quercus macrocarpa*) was observed in transects within the shrub layer but not at tree height. The only conifer species encountered was white spruce (*Picea glauca*), which had been planted at the former location of the pasture manager's headquarters. American

elm (*Ulmus americana*) and Manitoba maple (*Acer negundo*) were also found in the pasture (not in transects). These species had also been planted at the former location of the pasture manager's headquarters and on an old homestead site in the pasture.

Cattle trails were evident in all woodland transects visited.

Table 5. Summary of forested habitat, Lakeview Community Pasture.

Woodland, Lakeview
Transects A1a; A1b; A1d; B1; B1a.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
Open canopy mid-aged trembling aspen, with moderate tall shrub layer and sparse herbaceous layer. High litter cover.
Woody species
Typical species included trembling aspen; balsam poplar; chokecherry (*Prunus virginiana*); saskatoon (*Amelanchier alnifolia*); western snowberry (*Symphoricarpos occidentalis*); red-osier dogwood (*Cornus stolonifera*); poison-ivy (*Rhus radicans*); rose (*Rosa* sp.).
Herbaceous species
Poa species were often the dominant grass. Typical species included wheatgrasses (*Agropyron* spp.); white-grained mountain rice grass (*Oryzopsis asperifolia*); purple oat grass (*Schizachne purpurascens*); Lindley's aster (*Aster ciliolatus*); smooth aster (*Aster laevis*); fringed loosestrife (*Lysimachia ciliata*); black medick (*Medicago lupulina*); snakeroot (*Sanicula marilandica*); northern bedstraw (*Galium boreale*); wild sarsaparilla (*Aralia nudicaulis*); dewberry (*Rubus pubescens*); smooth wild strawberry (*Fragaria virginiana*); two-leaved Solomon's-seal (*Maianthemum canadense*).
Birds
36 species total recorded for this habitat type. See Table 23 (c), Appendix VIII.
Comments
Forested areas appear to be used primarily for cover and shelter, rather than for grazing.
For further information
Refer to Tables 17 and 18, Appendix V; and Figures 3, 4, and 6, Appendix IX.

4.2. Westbourne Community Pasture

4.2.1. Grassland

Many of the sites visited on the Westbourne Community Pasture were very wet during the summer of 2000. Some of the grassland areas sampled were dominated by moisture tolerant species. These sites could be classified in moist years as wet meadows: some wetland species present in an otherwise grassland type community. Eight grassland transects were sampled with 89 plant species encountered.

Cattle grazing was evident in all grassland pastures visited.

i) Good Condition Grassland

See section 4.1.1(i) above for description of good grassland. Many of the grassland sites on Westbourne occurred in a mosaic of low-lying areas; consequently, the species composition included plants well suited to moisture. There are few transects occurring in

fields classified as Good by study participants because the grassland sites on Westbourne generally had a much lower species diversity than those found in the Lakeview pasture.

Table 6. Summary of good condition grassland habitat, Westbourne Community Pasture.

Good Condition Grassland, Westbourne
Transects C4b.
Location
See Figure 2 for general location and Appendix II for exact location and date.
Description
A combination of high number of species present and high herbaceous cover values, low bare ground values and appearance of good growth habit of grass species present; also based on a visual assessment of the area.
Herbaceous species
Typical species included Kentucky bluegrass, slender wheatgrass, sedge, thimbleweed (*Anemone cylindrica*), stiff goldenrod (*Solidago rigida*), mountain goldenrod (*Solidago spathulata*), everlastings, many-flowered aster.
Birds
27 species total recorded for this habitat type. See Table 24 (a), Appendix VIII.
For further information
Refer to Tables 19 and 20, Appendix VI; and Figure 9, Appendix IX.

ii) Moderate Condition Grassland

See section 4.1.1(ii) above for description of moderate condition grassland.

Table 7. Summary of moderate condition grassland habitat, Westbourne Community Pasture.

Moderate Condition Grassland, Westbourne
Transects C4.
Location
See Figure 2 for general location and Appendix II for exact location and date.
Description
An intermediary classification between good and poor condition, described above and below. Assessment is based on same factors of herbaceous and bare ground cover values, overall appearance of the condition of growth habit of species present and degree of cattle use and traffic in the area.
Herbaceous species
Typical species include Kentucky bluegrass, slender wheatgrass, smooth brome (*Bromus inermis*), blue joint (*Calamagrostis* sp.), Canada thistle (*Cirsium arvense*), sweet clover (*Melilotus* sp.), sedge, many-flowered aster, Canada goldenrod (*Solidago canadensis*), common yarrow (*Achillea millefolium*), and baltic rush.
Birds
No data collected specifically for this habitat type but are expected to be similar to the grassland data from Table 6 above.
For further information
Refer to Tables 19 and 20, Appendix VI; and Figure 9, Appendix IX.

iii) Poor Condition Grassland

See section 4.1.1(iii) above for description of poor condition grasslands. Sites classified as poor had a marked reduction in the number of species present compared to other conditions. Forb species were often the dominant herbaceous cover; non-native or planted grass (reed canary grass) provided the bulk of the grass cover. Often these sites were situated in fields or areas with a dominant wetland habitat type, resulting in greater grazing pressures on the fewer upland sites.

Table 8. Summary of poor condition grassland habitat, Westbourne Community Pasture.

Poor Condition Grassland, Westbourne
Transects C1; C1 (t2); C1b; C3; C3a; C4a.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
A combination of low number of species and low herbaceous cover values, high bare ground values and appearance of poor growth habit of grass species present or domination of forb species; based on a visual assessment of the area.
Herbaceous species
Typical species include Kentucky bluegrass, reed canary grass, quack grass (*Agropyron repens*), common dandelion (*Taraxacum officinale*), silverweed (*Potentilla anserina*), sedge, smooth brome, baltic rush, Canada thistle, wild licorice.
Birds
No data collected specifically for this habitat type but are expected to be similar to the grassland data from Table 6 above.
Comments
These sites were often found near large sloughs or high traffic areas, so receive more concentrated grazing due to general cattle preference for upland areas.
For further information
Refer to Tables 19 and 20, Appendix VI; and Figures 9, 10, and 11, Appendix IX.

4.2.2. Wetland

Five wetland sites were sampled, with transects located at the edges of the marshes. Wetland sites on Westbourne were similar to those on Lakeview. Dominant species were sedges, bulrush and moisture tolerant grasses. A total of 42 plant species were observed in Westbourne pasture wetland habitats.

Cattle use of wetland areas was primarily to access the water source and secondarily to graze. Evidence of grazing was observed, though intensity was generally low for this habitat type.

Table 9. Summary of wetland habitat, Westbourne Community Pasture.

Wetland, Westbourne
Transects C1; C1b; C3; C4; C4b.
Location
Multiple. See Figure 2 for general locations and Appendix II for exact locations and dates.
Description
Slough edges and flooded grassland in low-lying areas of the pasture. Dominated by sedges, bulrush and wetland grass species.
Herbaceous species
Typical species present included reed grasses, reed canary grass, smooth-fruited sedge, bulrush, seaside arrow grass, woundwort and common mint.
Birds
26 species were recorded for this habitat type. See Table 24 (b), Appendix VIII.
Comments
Wetland areas had lower grazing pressure than nearby upland areas.
For further information
Refer to Tables 21 and 22, Appendix VII; and Figures 9, 10, and 11, Appendix IX.

4.3 Summary

Appendices X and XI include complete lists summarizing all plant and bird species found in Lakeview and Westbourne Community Pastures respectively. Table 10 summarizes these findings.

Table 10. Summary of plant and bird species observed in the Lakeview and Westbourne Community Pastures between June and August, 2000.

Number of species of:	**Lakeview**	**Westbourne**	**Lakeview and Westbourne**
Plants			
Identified species	228	106	250
Rare to uncommon plants	9	4	10
Non-native plants	15	11	16
Unidentified species	19	6	23
Birds			
Identified species	74	34	81
Rare to uncommon species	6	7	8

"Species" includes subspecies and varieties where applicable. Species considered rare to uncommon are based on Manitoba Conservation Data Centre species ranking system. Unidentified plants were not included in the total because they may already be correctly identified from other areas or times of the season.

A total of 250 plant taxa were identified in the two community pastures, along with 23 taxa of unconfirmed identities at the writing of this report.

Ten plant species considered provincially rare to uncommon according to the Manitoba Conservation Data Centre status ranks were observed within the Lakeview and/or Westbourne Community Pastures:

a. Four plant species were observed from the S2 ranking. They are: rigid sedge (*Carex tetanica* Schkuhr); Canada hawkweed (*Hieracium canadense* Michx.), whorled milkwort (*Polygala verticillata* L.), and Riddell's goldenrod (*Solidago riddellii* Frank *ex* Riddell). A rank of S2 corresponds to "rare throughout its sub-nation (i.e. province), typically 6 to 20 occurrences. May be vulnerable to extirpation".
b. Five species were observed with a rank of S3: smooth-fruited sedge (*Carex laeviconica* Dewey), Parry's sedge (*Carex parryana* Dewey), Small's spike rush (*Eleocharis smallii* Britt.), yellow stargrass (*Hypoxis hirsuta* (L.) Coville), and green needle grass (*Stipa viridula* Trin.). An S3 ranking denotes a plant that is "uncommon throughout its sub-nation".
c. A single plant species, cinquefoil (*Potentilla pensylvanica* L.), in the intermediary rank of S2S3 was observed. Intermediary ranks denote some uncertainty as to the exact status of the species.

Bird species observed were typical to what is expected for sites within the Aspen Parkland of western Manitoba. Eighty-one species of birds were observed from both pasture areas. The two pastures did not have a similar number of species observations mainly because the Westbourne pasture generally lacks woodland habitat. Any species primarily or preferentially associated with this habitat type are also lacking. A second explanation may be the type of grassland present at both sites. Westbourne grassland tended to have a wetter species composition, with fewer areas of dry native grass ridges. Birds that prefer these dry grass habitat areas may not be generally as abundant in Westbourne as they are in Lakeview. Thirdly, the general overall quality of grassland sites on Lakeview was higher than on Westbourne, based on the grassland classifications used in this study. A reduced grassland quality ostensibly results in lower bird species diversity within the habitat type.

A total of eight species recorded during the study period are considered uncommon provincially by the Conservation Data Centre:

a. Peregrine falcon (*Falco peregrinus*) is considered very rare (S1). This sighting was by D. Chranowski and occurred on the road north of the Lakeview pasture.
b. Trumpeter swan (*Cygnus columbianus*) is considered extirpated from Manitoba (SXSPB). This bird was sighted flying east into Westbourne pasture by R. Jones and K. Newman on the Pembroke road.
c. American white pelican (*Pelecanus erythrorhynchos*) is considered uncommon (S3B).
d. The remaining five species: black-crowned night-heron (*Nycticorax nycticorax*); black tern (*Chlidonias niger*); Forster's tern (*Sterna forsteri*); short-eared owl (*Asio flammeus*); and upland sandpiper (*Bartramia longicauda*) are intermediary between the ranks of Uncommon and Apparently Secure (S3S4B). A range between two

consecutive ranks denotes the range of uncertainty about the exact status of the species. (Duncan 1996).

Differences between the species composition observed on the Lakeview and Westbourne Community Pastures can be attributed to several factors.

- The most basic difference between the two pastures is their soil types, resulting in different vegetative potentials. Westbourne soils have developed from lacustrine soils, which are siltier and have generally poorer drainage. The eastern half of Westbourne pasture is a half bog made up of organic soils, which cannot support the same type of plant growth as elsewhere on the pasture.

- The history of the two areas is also different. Prior to 1909, Westbourne pasture was covered by Big Grass Marsh. The partial drainage of the marsh was responsible for creating more land with grazing potential. However, much of the Westbourne pasture is made up of low-lying areas, which may not dry up in wetter years. Surface water is poorly drained on these types of soils, resulting over time in a species composition more suited to this moister environment.

- The ecology on the two pastures is also different, due partly to their differing soils and water regimes. Westbourne is almost completely lacking in the type of brush component found on Lakeview. The wet meadow habitat, an intermediary habitat found in wetter years on Westbourne is not found to such a degree on Lakeview.

- Management practices have also been slightly different. Lakeview, with its greater brush component and wooded areas, has had more brush cleared and more burning than Westbourne. Finally, Westbourne has had over 1000 hectares seeded to reed canary grass, whereas there has been very little planted grass cover on Lakeview.

Plant and animal species lists derived from these types of studies are not definitive. Transect sites were chosen as a representation of a particular habitat type within a given field. Incidental plant and bird species observations were taken from this representative site, without a formal inventory throughout the entire field. For the most part, few of the frequently occurring species will have been missed. However, the absence of any species from the data and this final report does not necessarily indicate its absence from the area. As always, the longer one looks, the more one sees.

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Appendix I

PFRA data sheets used for grassland/wetland and woodland pastures in the Lakeview and Westbourne Community Pastures.

PFRA Range Condition Data Sheet for Grassland Pastures

Pasture : **Field :**

Transect #	Survey Location:	Observer:	Date:
Soil/Veg. Zone:	Major Veg. Type:	Range Use:	Grazing Intensity:

Grassland

Soil/Vegetation Zone	**Major Vegetation Type**	**Range Use**	**Grazing Intensity**
1. Dry Brown/Mixed grass 2. Moist Brown/Mixed grass 3. Dark Brown/Mixed grass 4. Black/Fescue 5. Black/Tall grass	1. Native grassland 2. Tame grass 3. Native/reverted cultivated land 4. Wetland	P=Primary S=Secondary N=Non use	(Longterm) U=Unused L=Light M=Moderate H=Heavy

(Note: Quadrat size = 20 x 50 cm)

Range Condition Evaluation

Species: herbs	1	2	3	4	5	6	7	8	9	10	AVG

Daubenmire Cover Class

	1	2	3	4	5	6	7	8	9	10
Total Herbaceous										
Bare ground										
Clubmoss										
Litter										

Cont'd...

PFRA Range Condition Data Sheet for Grassland Pastures

LOCATION (")

	°	'	1	2	3	4	5	6	7	8	9	10
N												
W												

Comments:

Data Entered? Y N	Date:	Entered by:

Modified Daubenmire Cover Classes:

Class	Range	Mid-point
0	0%	0%
1	0-1%	0.5%
2	1-5%	3%
3	5-25%	15%
4	25-50%	37.5%
5	50-75%	62.5%
6	75-95%	85%
7	95-100%	97.5%

PFRA Range Condition Data Sheet for Forested Pastures

Pasture: **Field:**

Transect #	Survey location	Observer	Date
Vegetation Zone:	Major Vegetation Type:	Range use:	Grazing intensity:

Forested

Vegetation Zone	**Major Vegetation Type**	**Range use**	**Grazing intensity** (long term)
1. Shortgrass 2. Mixedgrass 3. Parkland 4. Mixedwood 5. Boreal forest 6. Tallgrass	1. Native grassland 2. Cleared/ Tame grass 3. Forest areas 4. Cleared/ Native 5. Marsh	P - Primary S - Secondary N - Non-use	U -Unused L -Light M -Moderate H -Heavy

Quadrat size: 0.5 m X 0.5 m

Herbaceous layer

Species	1	2	3	4	5	6	7	8	9	10	avg

Daubenmire Cover Class

	1	2	3	4	5	6	7	8	9	10
TOTAL HERBACEOUS										
BARE GROUND										
MOSS & LICHEN										
LITTER										

Cont'd...

PFRA Range Condition Data Sheet for Forested Pastures

Pasture: **Field:**

Transect #	Survey location	Observer	Date

Woody Cover

SPECIES	DDC	Median Ht (m)	Ht Range (m)	Area covered %

Range Condition Score:

Good
Fair
Poor

Location (")

N	°	'										
W	°	'										

Comments:

Data entered? Y N	Date entered:	Entered by:

Appendix II

Locations and dates of vegetation transects and bird point count plots in the Lakeview and Westbourne Community Pastures. All UTM co-ordinates in NAD83, Zone 14.

Table 11(a)-(b). Field, direction, date and location of Lakeview Pasture of grassland vegetation transects.

(a) Grassland transects

Field	Dir.	Date	Legal desc.	UTM plot 1		UTM plot 10	
A1	N	09-Aug-00	SE 35-15-10W	0518936 E	5574240 N	0518971 E	5574317 N
A1a	ESE	27-Jul-00	NW 1-16-10W	0519607 E	5576792 N	0519811 E	5576765 N
A1b	SSE	26-Jul-00	SW 27-15-10W	0516339 E	5571037 N	0516387 E	5570975 N
A1d	S,N	03-Aug-00	SW 25-15-10W	0519406 E	5572284 N	0519378 E	5572204 N
A2	NNW	02-Aug-00	NW 33-15-10W	0514760 E	5573655 N	0514666 E	5573806 N
A2a	WNW	01-Aug-00	SW 31-15-10W	0511400 E	5574170 N	0511267 E	5574292 N
A2b	N	02-Aug-00	NE 31-15-10W	0511741 E	5574937 N	0511679 E	5575103 N
A2c	SE	01-Aug-00	NW 5-16-10W	0513256 E	5576657 N	0513350 E	5576504 N
A2d	S	26-Jul-00	SE 21-15-10W	0515553 E	5570736 N	0515592 E	5570631 N
B1	S,N	31-Jul-00	NW 11-16-10W	0518993 E	5578903 N		
B1a	N	04-Aug-00	SE 22-16-10W	0516072 E	5580492 N	0516004 E	5580618 N
B2	S	01-Aug-00	NE 9-16-10W	0515109 E	5578086 N	0515184 E	5577922 N
B3a	E	20-Jul-00	SW 17-16-10W	0513266 E	5578593 N	0513347 E	5578593 N
B5	SE	20-Jul-00	SE 20-16-10W	0513670 E	5580353 N	0513803 E	5580206 N
B6	NNW	21-Jul-00	SW 18-16-10W	0511618 E	5578481 N	0511564 E	5578540 N
B8	N	11-Aug-00	NW 18-16-10W	0512047 E	5579568 N	0512034 E	5579725 N
B8a	S	20-Jul-00	NE 20-16-10W	0513232 E	5581112 N	0513256 E	5580915 N

(b) Wetland transects

Field	Dir.	Date	Legal Desc.	UTM plot 1		UTM plot 10	
A1a	S	27-Jul-00	NW 1-16-10W	0519528 E	5576541 N	0519497 E	5576380 N
B1	NNE	31-Jul-00	NW 11-16-10W	0518973 E	5578945 N	0518917 E	5579097 N
B6	N	21-Jul-00	SW 18-16-10W	0511336 E	5578854 N	0511285 E	5579024 N
B8	NW	08-Aug-00	NW 18-16-10W	0511203 E	5580683 N	0511089 E	5580830 N
B8a	S	20-Jul-00	NE 20-16-10W	0513207 E	5581075 N	0513213 E	5580889 N

(b) Forested transects

Field	Dir.	Date	Legal Desc.	UTM plot 1		UTM plot 10	
A1a	S	27-Jul-00	NW 1-16-10W	0519610 E	5576625 N	0519623 E	5576433 N
A1b	SW	26-Jul-00	NW 34-15-10W	0516118 E	5573821 N	0516039 E	5573767 N

A1d	W	03-Aug-00	NW 36-15-10W	0519964 E	5574694 N	0519861 E	5574698 N
B1	S	31-Jul-00	NE 14-16-10W	0519141 E	5580644 N	0519122 E	5580561 N
B1a	SSE	24-Jul-00	SW22-16-10W	0516068 E	5579846 N	0515948 E	5580052 N

Table 12 (a)-(b). Field, direction, date and location of Westbourne Community Pasture vegetation transects.

(a) Grassland transects

Field	Dir.	Date	Legal Desc.	UTM plot 1		UTM plot 10	
C1	W	25-Jul-00	NW 10-16-11W	0506097 E	5578223 N	0505887 E	5578160 N
C1(t2)	N	25-Jul-00	NE 9-16-11W				
C1b	SSW	18-Jul-00	NE 28-15-11W	0505639 E	5573473 N	0505541 E	5573292 N
C3	SSW	27-Jul-00	NW 34-16-11W	0506308 E	5584639 N	0506283 E	5584575 N
C3a	N	17-Jul-00	NE 28-16-11W	0505786 E	5582057 N	0505774 E	5582264 N
C4	W	19-Jul-00	SW 22-16-11W	0506251 E	5580730 N	0506162 E	5580582 N
C4a	N	25-Jul-00	NW 16-16-11W	0504842 E	5579612 N	0504747 E	5579801 N
C4b	S	19-Jul-00	NW 15-16-11W	0506086 E	5579840 N	0506158 E	5580050 N

(b) Wetland transects

Field	Dir.	Date	Legal Desc.	UTM plot 1		UTM plot 10	
C1	N,S	25-Jul-00	NW 10-16-11W	0506164 E	5577883 N	0506218 E	5577890 N
C1b	E	18-Jul-00	NW 27-15-11W	0506461 E	5573081 N	0506566 E	5573015 N
C3	E	18-Jul-00	SW 27-16-11W	0506538 E	5582146 N	0506721 E	5582198 N
C4	SE	19-Jul-00	NW 22-16-11W	0506664 E	5581146 N	0506602 E	5581043 N
C4b	S	28-Jul-00	NW 15-16-11W	0506505 E	5578631 N	0506580 E	5578609 N

Appendix III

Data summary for Lakeview Community Pasture, grassland habitat transects.
The estimated biomass (%) is averaged for ten quadrats for each species with a biomass >5%, occurring in at least one quadrat on the transect. The mean percent cover values of total herbaceous species, bare ground, moss/lichen and litter are averaged for the transect. No clubmoss was present in any quadrat of any transect. Incidental species observations include species observed at <5% on the transect and for habitat type in each field.

Table 13 (a)-(q). Grassland transect summary for Lakeview Community Pasture.

Table 13 (a). Transect A1

Species	Biomass %	Incidental observations
Carex spp.	30.3	*Achillea millefolium*
Juncus balticus	11.0	*Agropyron trachycaulum var. unilaterale*
Muhlenbergia cuspidata	7.5	*Amelanchier alnifolia*
Aster ericoides	5.6	*Aster junciformis*
Eleocharis spp.	5.0	*Aster laevis*
Agropyron trachycaulum	4.4	*Aster novae-angliae*
Poa pratensis	3.1	*Astragalus* sp.
Andropogon scoparius	3.0	*Betula pumila*
Glycyrrhiza lepidota	3.0	*Campanula rotundifolia*
Calamagrostis inexpansa	2.8	*Cirsium flodmanii*
Muhlenbergia asperifolia	2.5	*Cirsium* sp.
Spartina pectinata	2.5	*Elaeagnus commutata*
Senecio sp.	2.5	*Erigeron lonchophyllus*
Andropogon gerardii	2.2	*Gentiana affinis*
Apocynum cannabinum	1.9	*Grindelia squarrosa*
Crepis tectorum	1.9	*Helianthus laetiflorus*
Hordeum jubatum	1.5	*Helianthus maximiliani*
Solidago spathulata	1.3	*Hordeum jubatum*
Panicum virgatum	1.3	*Juncus longistylis*
Galium boreale	1.2	*Juncus torreyi*
Sporobolus heterolepis	0.8	*Lonicera dioica*
Liatris ligulistylis	0.7	*Populus tremuloides*
Potentilla anserina	0.7	*Puccinellia nuttalliana*
Solidago rigida	0.7	*Ranunculus cymbalaria*
Agoseris glauca	0.6	*Rudbeckia hirta*
Aster ptarmicoides	0.5	*Salix* sp.
Lycopus asper	0.5	*Scirpus* sp.
Plantago eriopoda	0.5	*Smilacina stellata*
Solidago canadensis	0.5	*Solidago graminifolia*
Solidago spp.	0.5	*Solidago rigida*
		Stachys palustris
Total herbaceous	54.8	*Taraxacum officinale*
Bare Ground	13.0	*Viola* spp
Moss & Lichen	2.4	*Zizia aptera*
Litter	64.3	
		One unidentified forb

Table 13 (b). Transect A1a

Species	Biomass %	Incidental observations
Agrostis stolonifera	29.5	*Agoseris glauca*
Carex spp	23.0	*Agropyron trachycaulum*
Poa pratensis	17.0	*Agropyron trachycaulum var. unilaterale*
Glycyrrhiza lepidota	13.0	*Allium stellatum*
Taraxacum officinale	2.8	*Ambrosia psilostachya*
Andropogon gerardii	2.0	*Andropogon scoparius*
Antennaria sp.	1.3	*Anenome cylindrica*
Juncus balticus	1.0	*Betula pumila*
Juncus longistylis	1.0	*Campanula rotundifolia*
Muhlenbergia cuspidata	1.0	*Cirsium arvense*
Viola sp.	1.0	*Cirsium flodmanii*
Medicago lupulina	0.8	*Cornus stolonifera*
Prunella vulgaris	0.8	*Dalea candida*
Plantago eriopoda	0.5	*Elaeagnus commutata*
		Eleocharis sp.
Total herbaceous	69.0	*Erigeron philadelphicus*
Bare Ground	9.0	*Fragaria virginiana*
Litter	45.0	*Galium boreale*
Moss & Lichen	2.2	*Grindelia squarrosa*
		Hordeum jubatum
		Juncus torreyi
		Koeleria cristata
		Liatris ligulistylis
		Lobelia spicata
		Orthocarpus luteus
		Ranunculus sp.
		Rudbeckia hirta
		Salix spp
		Solidago canadensis
		Solidago rigida
		Solidago spathulata
		Solidago spp
		Spartina sp.
		Sporobolus heterolepis
		Symphoricarpos occidentalis

Table 13 (c). Transect A1b

Species	Biomass %	Incidental observations
Carex sp.	23.8	*Achillea millefolium*
Eleocharis sp.	16.0	*Agoseris glauca*
Agropyron trachycaulum	10.5	*Agrostis hyemalis*
Poa pratensis	9.5	*Allium stellatum*
Panicum virgatum	8.5	*Anenome cylindrica*
Stipa sp.	5.0	*Antennaria* sp.
Andropogon scoparius	3.5	*Aster ericoides*
Andropogon gerardii	2.0	*Aster laevis*
Solidago spathulata	2.0	*Campanula rotundifolia*
Helianthus sp.	1.7	*Dalea purpurea*
Cirsium flodmanii	1.5	*Galium boreale*
Muhlenbergia cuspidata	1.5	*Glycyrrhiza lepidota*
Solidago graminifolia	1.5	*Hordeum jubatum*
Agropyron trachycaulum var. unilaterale	1.0	*Liatris ligulistylis*
Aster ptarmicoides	1.0	*Lobelia spicata*
Solidago rigida	1.0	*Polygala* sp.
Sporobolus heterolepis	1.0	*Populus tremloides*
Comandra umbellata	0.7	*Ranunculus* sp.
Calamagrostis sp.	0.5	*Ranunculus* sp.
Juncus longistylis	0.5	*Rudbeckia hirta*
Zigadenus elegans	0.5	*Senecio* sp.
		Sisyrinchium montana
Total herbaceous	69.3	*Smilacina stellata*
Bare Ground	6.1	*Solidago canadensis*
Litter	85.5	*Solidago* spp.
Moss & Lichen	0.0	*Sonchus arvensis*
		Sonchus sp.
		Symphoricarpos occidentalis
		Taraxacum officinale
		Thalictrum sp.
		Viola spp
		Two unidentified forbs

Table 13 (d). Transect A1d

Species	Biomass %	Incidental observations
Carex sp.	27.0	*Achillea millefolium*
Andropogon gerardii	12.0	*Agoseris glauca*
Spartina gracilis	9.0	*Agropyron smithii*
Poa pratensis	8.0	*Agropyron trachycaulum*
Juncus balticus	7.0	*Agropyron trachycaulum var. unilaterale*
Juncus longistylis	5.7	*Agrostis stolonifera*
Eleocharis sp.	4.9	*Allium stellatum*
Glycyrrhiza lepidota	4.5	*Apocynum cannabinum*
Aster ericoides	3.0	*Aster laevis*
Muhlenbergia cuspidata	2.7	*Aster novae-angliae*
Stipa spartea	2.0	*Aster ptarmicoides*
Solidago canadensis	1.2	*Astragalus* sp.
Solidago rigida	1.0	*Betula pumila*
Potentilla anserina	0.7	*Campanula rotundifolia*
Antennaria spp	0.5	*Cirsium* sp.
Helianthus sp.	0.5	*Gentiana affinis*
Solidago spp	0.5	*Helianthus laetiflorus*
Taraxacum officinale	0.5	*Helianthus maximiliani*
		Hordeum jubatum
Total herbaceous	50.0	*Juncus torreyi*
Bare Ground	12.5	*Koeleria cristata*
Litter	64.3	*Panicum virgatum*
Moss & Lichen	2.1	*Populus tremuloides*
		Potentilla sp.
		Ranunculus cymbalaria
		Ranunculus sp.
		Rudbeckia hirta
		Sisyrinchium montanum
		Solidago spathulata
		Sonchus sp.
		Spartina pectinata
		Viola sp.
		Zizia aurea
		One unidentified forb

Table 13 (e). Transect A2

Species	Biomass %	Incidental observations
Carex spp	14.8	*Achillea millefolium*
Andropogon scoparius	12.9	*Agropyron smithii*
Andropogon gerardii	12.5	*Agrostis hyemalis*
Eleocharis sp.	11.5	*Allium stellatum*
Panicum virgatum	9.0	*Anenome cylindrica*
Stipa spartea	5.7	*Aster laevis*
Poa pratensis	5.3	*Aster ptarmicoides*
Agropyron trachycaulum	5.2	*Astragalus* sp.
Aster ericoides	3.5	*Canpanula rotundifolia*
Sporobolus heterolepis	2.7	*Chenopodium album*
Antennaria sp.	2.2	*Cirsium flodmanii*
Helianthus laetiflorus	2.2	*Cirsium* sp.
Muhlenbergia cuspidata	2.2	*Comandra umbellata*
Lobelia sp.	0.5	*Dalea candida*
Smilacina stellata	0.5	*Dalea purpurea*
Solidago rigida	0.5	*Elaeagnus commutata*
		Gentiana affinis
Total herbaceous	47.5	*Gentiana andrewsii*
Bare Ground	22.0	*Geum triflorum*
Litter	38.0	*Glycyrrhiza lepidota*
Moss & Lichen	0.0	*Hordeum jubatum*
		Juncus longistylis
		Koeleria cristata
		Liatris ligulistylis
		Lobelia sp.
		Medicago lupulina
		Penstemon sp.
		Polygala verticillata
		Populus tremuloides
		Potentilla fruticosa
		Potentilla sp.
		Psoralea argophylla
		Rudbeckia hirta
		Rudbeckia hirta
		Senecio sp.
		Sisyrinchium montanum
		Solidago rigida
		Solidago spathulata
		Solidago spp
		Spirea alba
		Taraxacum officinale
		Thalictrum sp.
		Viola pedatifida

Table 13 (f). Transect A2a

Species	Biomass %	Incidental observations
Poa pratensis	42.1	*Allium stellatum*
Glycyrrhiza lepidota	11.5	*Anenome cylindrica*
Artemisia ludoviciana	6.5	*Aster ptarmicoides*
Aster ericoides	4.4	*Campanula rotundifolia*
Sporobolus heterolepis	3.7	*Cirsium arvense*
Astragalus sp.	3.0	*Cirsium flodmanii*
Agropyron smithii	2.0	*Crepis tectorum*
Agropyron trachycaulum var. unilaterale	2.0	*Dalea purpurea*
Ambrosia psilostachya	2.0	*Elaeagnus commutata*
Andropogon scoparius	1.5	*Grindelia squarrosa*
Meliotus officinalis	1.5	*Hordeum jubatum*
Carex spp	1.4	*Lepidium densiflorum*
Achillea millefolium	1.2	*Liatris ligulistylis*
Stipa spartea	1.2	*Linum lewisii*
Antennaria spp	1.0	*Lobelia* sp.
Bouteloua gracilis	1.0	*Medicago lupulina*
Comandra umbellata	1.0	*Orthocarpus luteus*
Muhlenbergia cuspidata	1.0	*Panicum virgatum*
Solidago sp.	1.0	*Potentilla novegica*
Helianthus laetiflorus	0.8	*Rudbeckia hirta*
Meliotus alba	0.7	*Salix* sp.
Agropyron trachycaulum	0.5	*Stipa viridula*
Koeleria cristata	0.5	*Taraxacum officinale*
Panicum virgatum	0.5	*Viola* sp.
Solidago rigida	0.5	
Spartina sp.	0.5	one unidentified forb
Total herbaceous	66.8	
Bare Ground	0.6	
Litter	90.3	
Moss & Lichen	0.0	

Table 13 (g). Transect A2b

Species	Biomass %	Incidental observations
Andropogon gerardii	27.5	*Agalinis tenuifolia*
Poa pratensis	27.5	*Agoseris glauca*
Carex spp	9.0	*Agrostis hyemalis*
Glycyrrhiza lepidota	4.0	*Allium stellatum*
Aster ericoides	3.2	*Andropogon scoparius*
Antennaria sp.	3.0	*Aster laevis*
Agropyron trachycaulum var. unilaterale	2.0	*Astragalus* sp.
Anenome cylindrica	1.5	*Campanula rotundifolia*
Panicum virgatum	1.5	*Cirsium arvense*
Solidago spathulata	1.5	*Dalea candida*
Achillea millefolium	1.0	*Elaeagnus commutata*
Crepis tectorum	1.0	*Galium boreale*
Eleocharis sp.	1.0	*Gentiana affinis*
Muhlenbergia cuspidata	1.0	*Grindelia squarrosa*
Spartina gracilis	0.7	*Helianthus laetiflorus*
Thalictrum sp.	0.7	*Helictotrichon hookeri*
Artemisia ludoviciana	0.5	*Heuchera richarsonii*
Dalea purpurea	0.5	*Hordem jubatum*
Gentianella amarella	0.5	*Juncus balticus*
Helianthus sp.	0.5	*Koeleria cristata*
Meliotus alba/officinalis	0.5	*Lobelia* sp.
Psoralea argophylla	0.5	*Meliotus alba*
Solidago canadensis	0.5	*Oenthera biennis*
Solidago spp	0.5	*Penstemon* sp.
Stipa spartea	0.5	*Plantago eriopoda*
Viola pedatifida	0.5	*Plantago major*
		Poa compressa
Total herbaceous	77.3	*Polygala verticilata*
Bare Ground	3.4	*Potentilla fruticosa*
Litter	81.0	*Potentilla norvegica*
Moss & Lichen	0.4	*Rudbeckia hirta*
		Sisyrinchium montanum
		Solidago canadensis
		Solidago rigida
		Spirea alba
		Taraxacum officinale
		Trifolium repens
		Viola sp.
		two unidentified forbs

Table 13 (h). Transect A2c

Species	Biomass %	Incidental observations
Carex spp	22.6	*Achillea millefolium*
Panicum virgatum	16.0	*Agropyron trachycaulum var. unilaterale*
Andropogon gerardii	13.5	*Allium stellatum*
Eleocharis sp.	10.5	*Anenome cylindrica*
Helianthus laetiflorus	8.0	*Antennaria* spp
Poa pratensis	6.2	*Aster ptarmicoides*
Muhlenbergia cuspidata	4.0	*Campanula rotundifolia*
Glycyrrhiza lepidota	3.0	*Carex aurea*
Ambrosia psilostachya	2.0	*Crepis tectorum*
Aster ericoides	2.0	*Dalea candida*
Cirsium flodmanii	2.0	*Dalea purpurea*
Aster laevis	1.7	*Dalea purpurea*
Agoseris glauca	1.0	*Elaeagnus commutata*
Solidago spp	1.0	*Gentiana affinis*
Andropogon scoparius	0.7	*Gentiana* sp.
Agropyron trachycaulum	0.5	*Helianthus maximiliani*
Sporobolus heterolepis	0.5	*Hordeum jubatum*
Stipa spartea	0.5	*Hypoxis hirsuta*
Juncus balticus	0.5	*Lobelia* sp.
		Plantago eriopoda
Total herbaceous	61.8	*Polygala verticillata*
Bare Ground	13.7	*Potentilla anserina*
Litter	35.8	*Rosa* sp.
Moss & Lichen	0.6	*Rudbeckia hirta*
		Salix sp.
		Scirpus validus
		Sisyrinchium montanum
		Solidago spathulata
		Viola sp.
		Zigadenus elegans
		one unidentified composite species

Table 13 (i). Transect A2d

Species	Biomass %	Incidental observations
Carex spp	37.0	*Achillea millefolium*
Andropogon gerardii	12.0	*Agoseris glauca*
Solidago rigida	8.2	*Agropyron smithii*
Poa pratensis	7.0	*Agropyron trachycaulum var. unilaterale*
Andropogon scoparius	5.0	*Agrostis hyemalis*
Aster laevis	3.2	*Allium stellatum*
Muhlenbergia cuspidata	3.0	*Antennaria* spp
Aster ericoides	2.2	*Betula pumila*
Eleocharis sp.	2.0	*Calamagrostis* sp.
Galium boreale	1.5	*Carex aurea*
Aster ptarmicoides	1.5	*Comandra umbellata*
Aster junciformis	1.0	*Elaeagnus commutata*
Cirsium flodmanii	1.0	*Gaillardia aristata*
Dalea purpurea	1.0	*Gentiana* sp.
Panicum virgatum	1.0	*Gentianella amarella*
Smilacina stellata	1.0	*Helianthus* sp.
Solidago spp	1.0	*Hordeum jubatum*
Solidago spathulata	0.7	*Hypoxis hirsuta*
Anenome cylindrica	0.5	*Koeleria cristata*
Dalea candida	0.5	*Liatris ligulistylis*
Geum triflorum	0.5	*Linum lewisii*
Lithospermum canescens	0.5	*Lobelia spicata*
Stipa spartea	0.5	*Orthocarpus luteus*
		Penstemon gracilis
Total herbaceous	77.3	*Plantago* sp.
Bare Ground	0.8	*Potentilla fruticosa*
Litter	76.0	*Potentilla norvegica*
Moss & Lichen	0.4	*Psoralea argophylla*
		Psoralea esculenta
		Ranunculus sp.
		Rudbeckia hirsuta
		Salix sp.
		Senecio sp.
		Sisyrinchium montanum
		Solidago graminifolia
		Spartina gracilis
		Taraxacum officinale
		Thalictrum sp.
		Viola pedatifida
		Zigadenus elegans
		one unidentified composite species

Table 13 (j). Transect B1

Species	Biomass %	Incidental observations
Carex sp.	49.5	*Achillea millefolium*
Spartina pectinata	8.0	*Campanula rotundifolia*
Andropogon scoparius	4.5	*Carex aurea*
Antennaria spp	4.0	*Cirsium flodmanii*
Panicum virgatum	4.0	*Comandra umbellata*
Andropogon gerardii	3.5	*Hordeum jubatum*
Juncus balticus	2.5	*Juncus* longistylis
Poa pratensis	2.5	*Koeleria cristata*
Eleocharis spp	2.4	*Liatris ligulistylis*
Pucinellia nuttalliana	2.0	*Lobelia* sp.
Aster ericoides	1.0	*Polygala senega*
Lithospermum canescens	1.0	*Populus balsamifera*
Pedicularis lanceolata	1.0	*Potentilla fruticosa*
Aster ptarmicoides	1.0	*Rudbeckia hirta*
Muhlenbergia cuspidata	0.7	*Senecio* sp.
Solidago spp	0.7	*Shepherdia canadensis*
Agropyron trachycaulum	0.5	*Sisyrinchium montanum*
Apocynum cannabium	0.5	*Solidago canadensis*
Aster laevis	0.5	*Solidago rigida*
Helianthus laetiflorus	0.5	*Solidago spathulata*
Ranunculus cymbalaria	0.5	*Taraxacum officinale*
Spiranthes romanzoffiana	0.5	*Zigadenus elegans*
Sporobolus heterolepis	0.5	
Stipa spartea	0.5	
Total herbaceous	64.5	
Bare Ground	13.5	
Litter	68.1	
Moss & Lichen	0.0	

Table 13 (k). Transect B1a

Species	Biomass %	Incidental observations
Carex spp	29.2	*Agoseris glauca*
Andropogon gerardii	16.8	*Achillea millefolium*
Andropogon scoparius	8.2	*Agropyron trachycaulum* var. *unilaterale*
Eleocharis sp.	8.2	*Ambrosia psilostachya*
Juncus balticus	7.0	*Anenome cylindrica*
Glycyrrhiza lepidota	4.5	*Aster laevis*
Poa pratensis	4.0	*Aster novae-angliae*
Agropyron trachycaulum	3.0	*Aster ptarmicoides*
Juncus longistylis	2.5	*Betula pumila*
Aster ericoides	1.5	*Campanula rotundifolia*
Dalea candida	1.5	*Cirsium* sp.
Solidago spp	1.2	*Crepis tectorum*
Cirsium flodmanii	1.0	*Elaeagnus commutata*
Panicum virgatum	1.0	*Erigeron lonchophyllus*
Stipa spartea	1.0	*Gentiana affinis*
Solidago canadensis	0.7	*Gentiana* sp.
Antennaria spp	0.5	*Hordeum jubatum*
Dalea purpurea	0.5	*Koeleria cristata*
Galium boreale	0.5	*Liatris ligulistylis*
Meliotus sp.	0.5	*Lycopus asper*
Muhlenbergia cuspidata	0.5	*Orthocarpus luteus*
		Potentilla anserina
Total herbaceous	50.0	*Prunella vulgaris*
Bare Ground	11.3	*Puccinellia nuttalliana*
Litter	50.0	*Ranunculus cymbalaria*
Moss & Lichen	0.6	*Rosa* sp.
		Rudbeckia hirta
		Salix sp.
		Sisyrinchium montanum
		Solidago rigida
		Soligago spathulata
		Spirea alba
		Sporobolus heterolepis
		Taraxacum officinale
		Thalictrum sp.
		Triglochin maritima
		Viola sp.
		one unidentified forb

Table 13 (l). Transect B2

Species	Biomass %	Incidental observations
Andropogon gerardii	16.0	*Agalinis tenuifolia*
Carex spp	15.5	*Agoseris glauca*
Panicum virgatum	10.5	*Allium stellatum*
Sporobolus heterolepis	8.0	*Ambrosia psilostachya*
Eleocharis sp.	6.5	*Antennaria* spp
Andropogon scoparius	5.5	*Betula pumila*
Solidago spp	5.0	*Campanula rotundifolia*
Aster ericoides	4.7	*Comandra umbellata*
Aster laevis	3.5	*Dalea candida*
Agropyron trachycaulum	3.0	*Dalea purpurea*
Muhlenbergia cuspidata	2.0	*Gentiana linearis*
Solidago spathulata	2.0	*Grindelia squarrosa*
Glycyrrhiza lepidota	1.5	*Helianthus maximiliani*
Liatris ligulistylis	1.5	*Hordeum jubatum*
Stipa spartea	1.5	*Juncus longistylis*
Cirsium flodmanii	1.2	*Koeleria cristata*
Solidago canadensis	1.2	*Lactuca* sp.
Helianthus laetiflorus	1.0	*Lobelia* sp.
Aster ptarmicoides	0.5	*Lotus corniculatus*
Pedicularis canadensis	0.5	*Meliotus alba*
Poa pratensis	0.5	*Plantago eriopoda*
Rubeckia hirta	0.5	*Polygala senega*
		Polygala verticillata
Total herbaceous	62.3	*Populus balsamifera*
Bare Ground	16.1	*Populus tremuloides*
Litter	36.0	*Potentila fruticosa*
Moss	1.2	*Puccinellia nuttalliana*
		Ranunculus cymbalaria
		Rosa sp.
		Sisyrinchium montanum
		Solidago rigida
		Spartina spp
		two unidentified forbs

Table 13 (m). Transect B3a

Species	Biomass %	Incidental observations
Poa pratensis	32.0	*Agropyron smithii*
Carex spp	16.5	*Agropyron trachycaulum*
Andropogon gerardii	8.8	*Allium stellatum*
Aster ericoides	8.5	*Ambrosia psilostachya*
Antennaria sp.	4.2	*Andropogon scoparius*
Panicum virgatum	4.0	*Anenome cylindrica*
Glycyrrhiza lepidota	3.0	*Anenome patens*
Solidago rigida	2.2	*Astragalus* sp.
Gentiana affinis	2.0	*Campanula rotundifolia*
Grindelia squarrosa	2.0	*Elaeagnus commutata*
unID glab forb	2.0	*Eleocharis* sp.
Aster ptarmicoides	1.7	*Erigeron asper*
Agropyron trachycaulum var. unilaterale	1.0	*Hypoxis hirsuta*
Andropogon scoparius	1.0	*Juncus* sp.
Dalea purpurea	1.0	*Koeleria cristata*
Geum triflorum	1.0	*Lobelia spicata*
Helianthus laetiflorus	1.0	*Medicago lupulina*
Achillea millefolium	0.5	*Muhlenbergia asperifolia*
Muhlenbergia spp	0.5	*Orthocarpus luteus*
Rudbeckia hirta	0.5	*Plantago eriopoda*
Sporobolus heterolepis	0.5	*Polygala senega*
		Potentilla fruticosa
Total herbaceous	69.0	*Psoralea argophylla*
Bare Ground	5.8	*Ranunculus* sp.
Litter	80.8	*Sisyrinchium montanum*
Moss & Lichen	0.4	*Solidago missouriensis*
		Solidago spathulata
		Solidago sp.
		Stipa spartea
		Symphoricarpos occidentalis
		Taraxacum officinale

Table 13 (n). Transect B5

Species	Biomass %	Incidental observations
Poa pratensis	24.0	*Agoseris glauca*
Carex spp	13.5	*Agropyron smithii*
Andropogon gerardii	10.0	*Allium stellatum*
Aster ericoides	7.0	*Androsace septentrionalis*
Panicum virgatum	6.0	*Campanula rotundifolia*
Glycyrrhirza lepidota	5.0	*Cirsium flodmanii*
Psoralea argophylla	4.0	*Comandra umbellata*
Juncus sp.	3.5	*Dalea candida*
Achillea millefolium	2.5	*Dalea purpurea*
Medicago lupulina	2.5	*Geum triflorum*
Antennaria spp	2.0	*Koeleria cristata*
Helianthus laetiflorus	2.0	*Muhlenbergia asperifolia*
Solidago spp	1.5	*Potentilla fruticosa*
Muhlenbergia cuspidata	1.4	*Potentilla pensylvanica*
Andropogon scoparius	1.0	*Psoralea esculenta*
Anenome patens	1.0	*Senecio* sp.
Galium boreale	1.0	*Sisyrinchium montanum*
Solidago sp. (glab)	1.0	*Solidago rigida*
Agropyron trachycaulum	0.5	*Stipa spartea*
Astragalus sp.	0.5	*Taraxacum officinale*
Cirsium sp.	0.5	*Viola sp.*
Eleocharis sp.	0.5	*Zigandenus elegans*
Gentiana affinis	0.5	
Rudbeckia hirta	0.5	
Sporobolus heterolepis	0.5	
Thalictrum venulosum	0.5	
unID composite species	0.5	
Agropyron trachycaulum var. unilaterale	0.4	
Total herbaceous	59.5	
Bare Ground	5.2	
Litter	64.5	
Moss & Lichen	0.7	

Table 13 (o). Transect B6

Species	Biomass %	Incidental observations
Poa pratensis	46.7	*Agropyron intermedium*
Solidago spp	7.3	*Agropyron trachycaulum*
Ambrosia psilostachya	7.0	*Aster laevis*
Aster ericoides	6.0	*Campanula rotundifolia*
Solidago spathulata	3.5	*Cirsium arvense*
Agropyron smithii	3.0	*Elaeagnus commutata*
Antennaria spp	2.5	*Erigeron* sp.
Astragalus danicus	2.5	*Gentianella amarella*
Cirsium flodmanii	2.5	*Geum* sp.
Carex sp.	2.0	*Grindelia squarrosa*
Comandra umbellata	2.0	*Hordeum jubatum*
Artemisia ludoviciana	1.3	*Juncus balticus*
Grindelia squarrosa	1.0	*Liatris ligulistylis*
Koeleria cristata	1.0	*Linum lewisii*
Soliago rigida	0.8	*Orthocarpus luteus*
Achillea millefolium	0.5	*Phalaris arundinaceae*
Agropyron trachycaulum var. unilaterale	0.5	*Plantago eripoda*
Anenome cylindrica	0.5	*Ranunculus* sp.
Bromus inermis	0.5	*Rudbeckia hirta*
Potentilla gracilis	0.5	*Rumex* sp.
Spartina gracilis	0.5	*Sisyrinchium montanum*
Solidago sp. (glab)	0.4	*Stipa spartea*
		Viola sp.
Total herbaceous	47.5	*Zizia aptera*
Bare Ground	8.9	
Litter	40.8	
Moss & Lichen	1.2	one unidentified forb

Table 13 (p). Transect B8

Species	Biomass %	Incidental observations
Poa pratensis	58.1	*Agropyron repens*
Carex spp	13.5	*Achillea millefolium*
Muhlenbergia asperifolia	4.5	*Agropyron trachycaulum var. unilaterale*
Antennaria spp	3.5	*Ambrosia psilostachya*
Sporobolus heterolepis	2.5	*Aster junciformis*
Grindelia squarrosa	2.0	*Astragalus danicus*
Potentilla argentea	2.0	*Astragalus* sp.
Aster ericoides	1.5	*Campanula rotundifolia*
Muhlenbergia cuspidata	1.5	*Cirsium arvense*
Plantago eriopoda	1.5	*Cirsium flodmanii*
Agropyron smithii	1.0	*Cirsium* sp.
Juncus balticus	1.0	*Dalea purpurea*
Solidago spp	1.0	*Distichlis stricta*
Taraxacum officinale	1.0	*Elaeagnus commutata*
Agropyron trachycaulum	0.5	*Erigeron lonchophyllus*
Artemisia ludoviciana	0.5	*Gentianella amarella*
		Glycyrrhiza lepidota
Total herbaceous	62.0	*Hordeum jubatum*
Bare Ground	9.1	*Medicago lupulina*
Litter	84.3	*Meliotus alba*
Moss & Fungus	0.5	*Orthocarpus luteus*
		Polygonum amphibium
		Potentilla anserina
		Potentilla norvegica
		Puccinellia nuttalliana
		Rosa sp.
		Solidago rigida
		Solidago sp.
		Solidago spathulata
		Sonchus sp.
		Spartina gracilis
		Stachys palustris
		Symphoricarpos occidentalis
		Viola sp.

Table 13 (q). Transect B8a

Species	Biomass %	Incidental observations
Poa pratensis	22.8	*Agropyron trachycaulum var. unilaterale*
Andropogon scoparius	14.0	*Asclepias speciosa*
Carex spp	10.0	*Aster junciformis*
Artemisia ludoviciana	6.5	*Aster laevis*
Solidago rigida	6.2	*Aster ptarmicoides*
Muhlenbergia sp.	5.5	*Campanula rotundifolia*
Astragalus sp.	4.5	*Eleocharis* sp.
Aster ericoides	3.0	*Galium boreale*
Comandra umbellata	3.0	*Gentianella amarella*
Ambrosia psilostachya	2.0	*Helictotrichon hookeri*
Agropyron smithii	1.5	*Juncus* sp.
Koeleria cristata	1.5	*Liatris ligulistylis*
Muhlenbergia asperifolia	1.5	*Medicago lupulina*
Panicum virgatum	1.5	*Melilotus alba*
Achillea millefolium	1.0	*Melilotus officinale*
Antennaria sp.	1.0	*Rosa* sp.
Linum lewisii	1.0	*Rubus pubescens*
Agoseris glauca	0.5	*Rudbeckia hirta*
Agropyron repens	0.5	*Salix* spp
Agropyron trachycaulum	0.5	*Senecio* sp.
Anenome cylindrica	0.5	*Sisyrinchium montanum*
Cirsium flodmanii	0.5	*Sonchus* sp.
Grindelia squarrosa	0.5	*Stipa spartea*
Helianthus laetiflorus	0.5	
Orthocarpus luteus	0.5	one unidentified forb
Potentilla pensylvanica	0.5	
Spartina gracilis	0.5	
Viola sp.	0.5	
Total herbaceous	50.0	
Bare Ground	13.8	
Litter	28.8	
Moss & Lichen	3.6	

Table 14. List of all plant species observed in grassland habitat, Lakeview Community Pasture.

Achillea millefolium	*Dalea candida*	*Orthocarpus luteus*
Agalinis tenuifolia	*Dalea purpurea*	*Panicum virgatum*
Agoseris glauca	*Distichlis stricta*	*Pedicularis canadensis*
Agropyron repens	*Elaeagnus commutata*	*Pedicularis lanceolata*
Agropyron smithii	*Eleocharis* sp.	*Penstemon gracilis*
Agropyron trachycaulum	*Erigeron lonchophyllus*	*Penstemon* sp.
Agropyron trachycaulum var. unilaterale	*Erigeron philadelphicus*	*Plantago eriopoda*
Agrostis hyemalis	*Erigeron asper*	*Plantago major*
Agrostis stolonifera	*Euphorbia esculenta*	*Plantago* sp.
Allium stellatum	*Gaillardia aristata*	*Poa compressa*
Ambrosia psilostachya	*Galium boreale*	*Poa pratensis*
Amelanchier alnifolia	*Gentiana affinis*	*Polygala senega*
Andropogon gerardii	*Gentiana linearis*	*Polygala verticillata*
Andropogon scoparius	*Gentiana* sp.	*Polygonum amphibium*
Androsace septentrionalis	*Gentianella amarella*	*Populus balsamifera*
Anenome cylindrica	*Geum triflorum*	*Populus tremuloides*
Anenome patens	*Glycyrrhiza lepidota*	*Potentilla anserina*
Antennaria parvifolia	*Grindelia squarrosa*	*Potentilla argentea*
Antennaria spp	*Helianthus laetiflorus*	*Potentilla fruticosa*
Apocynum cannabinum	*Helianthus maximiliani*	*Potentilla norvegica*
Artemisia ludoviciana	*Helianthus* sp.	*Potentilla pensylvanica*
Asclepias ovalifolia	*Helictotrichon hookeri*	*Prunella vulgaris*
Asclepias speciosa	*Heuchera richarsonii*	*Psoralea argophylla*
Aster ericoides	*Hordeum jubatum*	*Psoralea esculenta*
Aster junciformis	*Hypoxis hirsuta*	*Puccinellia nuttalliana*
Aster laevis	*Juncus balticus*	*Ranunculus cymbalaria*
Aster novae-angliae	*Juncus longistylis*	*Ranunculus* sp.
Aster ptarmicoides	*Juncus torreyi*	*Rosa* sp.
Astragalus danicus	*Koeleria cristata*	*Rubus pubescens*
Astragalus sp.	*Lactuca* sp.	*Rudbeckia hirta*
Betula pumila	*Lepidium densiflorum*	*Salix* spp
Bouteloua gracilis	*Liatris ligulistylis*	*Scirpus* sp.
Calamagrostis inexpansa	*Linum lewisii*	*Scirpus validus*
Calamagrostis sp.	*Lithospermum canescens*	*Senecio* sp.
Campanula rotundifolia	*Lobelia kalmii*	*Shepherdia canadensis*
Carex aurea	*Lobelia spicata*	*Sisyrinchium montanum*
Carex crawei	*Lonicera dioica*	*Smilacina stellata*
Carex sp.	*Lotus corniculatus*	*Solidago canadensis*
Carex utriculata	*Lycopus asper*	*Solidago graminifolia*
Chenopodium album	*Medicago lupulina*	*Solidago missouriensis*
Cirsium arvense	*Melilotus alba*	*Solidago rigida*
Cirsium flodmanii	*Melilotus officinale*	*Solidago* sp.
Cirsium sp.	*Muhlenbergia asperifolia*	*Solidago spathulata*
Comandra umbellata	*Muhlenbergia cuspidata*	*Sonchus arvensis*
Crepis tectorum	*Muhlenbergia richardsonis*	*Sonchus sp.*

Spartina gracilis	*Stipa viridula*	*Viola pedatifida*
Spartina pectinata	*Symphoricarpos occidentalis*	*Viola* sp.
Spiranthes romanzoffiana	*Taraxacum officinale*	*Zigandenus elegans*
Spirea alba	*Thalictrum* sp.	*Zizia aptera*
Sporobolus heterolepis	*Thalictrum venulosum*	
Stachys palustris	*Trifolium repens*	9 unidentified forbs
Stipa spartea	*Triglochin maritima*	

Appendix IV

Data summary for Lakeview Community Pasture, wetland habitat transects.
The estimated biomass (%) is averaged for ten quadrats for each species with a biomass >5%, occurring in at least one quadrat on the transect. The mean percent cover values of total herbaceous species, bare ground, moss/lichen and litter are averaged for the transect. No clubmoss was present in any quadrat of any transect. Incidental species observations include species observed at <5% on the transect and for habitat type in each field.

Table 15 (a)-(e). Wetland transect summary for Lakeview Community Pasture.

Table 15 (a). Transect A1a

Species	Biomass %	Incidental observations
Carex sp.	76.7	*Calamagrostis canadensis*
Eleocharis sp.	2	*Calamagrostis inexpansa*
Juncus balticus	8	*Juncus* sp. (small star)
Juncus torreyi	0.5	*Lycopus asper*
Scirpus validus	5.5	*Poa palustris*
Triglochin maritima	3	*Polygonum amphibium*
Typha latifolia	1.5	*Stachys palustris*
		Utricularia vulgaris
Total herbaceous	25.05	
Bare Ground	0	
Litter	11.8	
Moss & Lichen	11.5	

Table 15 (b). Transect B1

Species	Biomass %	Incidental observations
Carex sp.	74.5	*Eriophorum* sp.
Juncus balticus	10	*Poa palustris*
Scirpus validus	6	*Potentilla anserina*
Sium suave	2.5	*Salix* spp.
Eleocharis sp.	1.5	*Stachys palustris*
Calamagrostis canadensis	1	*Typha angustifolia*
Calamagrostis sp.	1	*Typha latifolia*
Triglochin maritima	1	*Utricularia vulgaris*
Apocynum cannabinum	0.5	
Lycopus asper	0.5	
Spartina pectinata	0.5	
Total herbaceous	31.5	
Bare Ground	0	
Litter	31.25	
Moss & Lichen	16.5	

Table 15 (c). Transect B6

Species	Biomass %	Incidental observations
Carex spp.	64.0	*Cirsium arvense*
Eleocharis sp.	8.5	*Hordeum jubatum*
Scirpus validus	6.5	*Muhlenbergia asperifolia*
Juncus balticus	5.0	*Phalaris arundinacea*
Calamagrostis canadensis	3.5	*Potentilla anserina*
Lycopus asper	3.0	*Rosa* sp.
Aster junciformis	2.0	*Salix* sp.
Cirsium sp.	2.0	*Sium suave*
unID Calamagrostis-like	2.0	*Sonchus* sp.
Phalaris arundinacea	1.0	
Stachys palustris	1.0	
Poa palustris	0.5	
Total herbaceous	33.3	
Bare Ground	0.1	
Litter	42.4	
Moss & Lichen	0.0	

Table 15 (d). Transect B8

Species	Biomass %	Incidental observations
Carex spp	19	*Agropyron repens*
Eleocharis sp.	17	*Cirsium arvense*
Potentilla anserina	13.5	*Cirsium flodmanii*
Aster junciformis	9	*Grindelia squarrosa*
Muhlenbergia asperifolia	9	*Juncus balticus*
Ambrosia psilostachya	5.5	*Juncus torreyi*
Calamagrostis inexpansa	5.5	*Mentha arvensis*
Phalaris arundinaceae	5.5	*Plantago eriopoda*
Poa sp.	3	*Scirpus validus*
Cirsium arvense	2.5	*Solidago canadensis*
Hordeum jubatum	2.5	*Solidago* sp.
Lycopus asper	2.5	*Sonchus* sp.
Aster ericoides	1	*Spartina gracilis*
Crepis sp.	1	*Symphoricarpos occidentalis*
Solidago sp.	0.5	*Taraxacum officinale*
Stachys palustris	0.5	
Total herbaceous	49.75	
Bare Ground	3.9	
Litter	95	
Moss & Lichen	0	

Table 15 (e). Transect B8a

Species	Biomass %	Incidental observations
Carex spp.	88.0	*Galium boreale*
Potentilla anserina	2.5	*Muhlenbergia asperifolia*
Calamagrostis canadensis	2.0	*Poa palustris*
Eleocharis sp.	1.5	*Scirpus validus*
Lycopus asper	1.5	
Aster junciformis	1.0	
Juncus sp. (small)	1.0	
Stachys palustris	1.0	
Total herbaceous	26.3	
Bare Ground	0.0	
Litter	0.0	
Moss & Lichen	0.0	

Table 16. List of all plant species found in Lakeview Community Pasture, wetland habitat.

Agropyron repens	*Juncus torreyi*
Alisma plantago-aquatica	*Lycopus asper*
Ambrosia psilostachya	*Mentha arvensis*
Apocynum cannabinum	*Muhlenbergia asperifolia*
Aster ericoides	*Phalaris arundinacea*
Aster junciformis	*Plantago eriopoda*
Calamagrostis inexpansa	*Poa palustris*
Calamagrostis canadensis	*Poa* sp.
Calamagrostis sp.	*Polygonum* sp.
Carex aquatilis	*Potentilla anserina*
Carex crawei	*Rosa* sp.
Carex laeviconica	*Salix* spp.
Carex lassiocarpa	*Scirpus validus*
Carex sp.	*Sium suave*
Carex tetanica	*Solidago canadensis*
Carex utriculata	*Solidago* sp.
Cirsium arvense	*Spartina gracilis*
Cirsium flodmanii	*Spartina pectinata*
Cirsium sp.	*Stachys palustris*
Crepis tectorum	*Symphoricarpos occidentalis*
Eleocharis sp.	*Taraxacum officinale*
Eriophorum sp.	*Triglochin maritima*
Galium boreale	*Typha angustifolia*
Grindelia squarrosa	*Typha latifolia*
Hordeum jubatum	*Utricularia vulgaris*
Juncus balticus	
Juncus sp. (small star)	2 unidentified species

Appendix V

Data summary for Lakeview Community Pasture, woodland habitat transects.
Vegetation tables for each transect include mean cover (%) for each herbaceous species; bare ground; litter; and moss/lichen. Woody species are included with the density distribution class (DDC); median height (m); and estimated percent cover. Incidental species observations are included for each field.

Table 17 (a)-(e). Woodland transect summary for Lakeview Community Pasture.

Table 17 (a). Transect A1a.

Herbaceous Species	Cover %	Woody species	DDC	Median ht (m)	Cover %
Poa pratensis	12.0	*Populus tremuloides*	8	15	60
Carex spp.	5.5	*Symphoricarpos occidentalis*	7	0.7	30
Thalictrum spp.	4.0	*Rosa* sp.	7	0.5	25
Fragaria virginiana	3.5	*Amelanchier anlifolia*	7	3	10
Maianthemum canadense	3.0	*Prunus virginiana*	4	2.5	10
Taraxacum officinale	2.5	*Rhus radicans*	8	0.25	10
Antennaria spp.	1.5	*Betula pumila*	5	2.25	5
Lithospermum canescens	1.5	*Cornus stolonifera*	5	2.5	<5
Rubus pubescens	1.5	*Ribes oxycanthoides*	5	0.7	<5
Arctium lappa	1.0	*Elaeagnus commutata*	2	0.3	T
Sanicula marilandica	1.0	*Potentilla fruticosa*	2	0.6	T
Solidago spp.	1.0	*Salix* sp.	2	2.25	T
Viola spp.	1.0	*Shepherdia canadensis*	2	0.5	T
Aster ciliolatus	0.5				
Smilax lasioneura	0.5	Incidental observations			
Zizia aptera	0.5	*Aster ericoides; Glycyrrhiza lepidota; Pedicularis* sp.; *Plantago* sp.;			
Zizia aureus	0.5	*Schizachne purpurascens; Agropyron* sp.; *Agropyron trachycaulum*			
Galium boreale	0.0	var. *unilaterale; Andropogon gerardii; Bromus ciliatus; Lathyrus* sp.;			
		Lysmachia ciliolatus; Meliotus spp; *Oryzopsis asperifolia;*			
		Rudbeckia hirta; Shepherdia canadensis; Viola sp.			
Total herbaceous	38.0				
Bare Ground	0.1	5 unidentified species			
Moss & Lichen	3.7				
Litter	96.3				

Table 17 (b). Transect A1b.

Herbaceous species	Cover %	Woody species	DDC	Median Ht. (m)	Cover %
Poa pratensis	7.0	*Populus tremuloides*	8	15	60
Carex spp.	5.5	*Symphoricarpos occidentalis*	7	0.7	30
Aster ciliolatus	5.0	*Amelanchier alnifolia*	5	3	20
Thalictrum dasycarpum	4.5	*Rhus radicans*	5	30	20
Antennaria sp.	3.0	*Rosa* sp.	4	0.3	10
Fragaria virginiana	3.0	*Prunus virginiana*	6	5	5
Maianthemum canadense	3.0	*Betula pumila*	2	2	<5
Taraxacum officinale	3.0	*Cornus stolinifera*	2	2.5	<5
Aralia nudicaulis	2.0	*Prunus pensylvanica*	2	6	<5
Sanicula marilandica	2.0	*Rubus idaeus*	4	0.5	<5
Lathyrus sp.	1.5	*Salix* sp.	2	3	<5
Oryzopsis asperifolia	1.5	*Crateagus* sp.	1	0.5	T
Aster laevis	1.0	*Elaeagnus commutata*	2	0.8	T
Viola sp.	1.0	*Lonicera dioica*	1	8	T
Agropyron trachycaulum var. unilaterale	0.5	*Potentilla fruticosa*	1	0.5	T
Aster sp.	0.5				
Galium boreale	0.5	Incidental observations			
Polygala senega	0.5	*Achillea millefolium; Actaea rubra; Agropyron sp.; Anemone*			
Smilacina stellata	0.5	*cylindrica; Aralia nudicaulis; Bromus ciliatus; Elymus canadensis;*			
		Equisetum sp.*; Erigeron philadelphicus; Lithospermum*			
Total herbaceous	26.5	*canescens; Melilotus* spp*; Petasites palmatus; Rudbeckia hirta;*			
Bare Ground	0.3	*Schizachne purpurascens; Solidago* sp.*; Zizia aptera; Zizia aurea.*			
Moss & Lichen	1.3				
Litter	89.3	2 unidentified forbs			

Table 17 (c). Transect A1d.

Herbaceous Species	Cover %	Woody Species	DDC	Median Ht. (m)	Cover %
Poa pratensis	7.0	*Populus tremuloides*	8	7	60
Carex sp.	5.0	*Betula pumila*	6	2	20
Fragaria virginiana	5.0	*Amelanchier alnifolia*	8	2.5	20
Apocynum androsaemifolium	4.5	*Symphoricarpos occidentalis*	7	0.7	10
Taraxacum officinale	4.0	*Prunus virginiana*	6	3	10
Antennaria sp.	2.0	*Cornus stolinifera*	4	2	5
Aster ciliolatus	2.0	*Rhus radicans*	7	0.3	<5
Oryzopsis asperifolia	2.0	*Rosa* sp.	7	1	<5
Sanicula marilandica	2.0	*Potentilla fruticosa*	5	0.5	<5
Thalictrum sp.	2.0	*Ribes* sp.	5	0.5	<5
Viola sp.	2.0	*Crataegus* sp.	2	1.5	<5
Solidago sp.	2.0	*Salix* sp.	4	2.5	<5
Zizia aurea	1.5	*Elaeagnus commutata*	4	0.6	T
Andropogon gerardii	1.0				
Lathyrus sp.	1.0	Incidental observations			
Lithospermum canescens	1.0	*Agropyron repens; Agropyron trachycaulum* var. *unilaterale;*			
Lysimachia ciliata	1.0	*Agrostis hyemalis; Andropogon scoparius; Arctostaphylos*			
Rubus pubescens	1.0	*uva-ursi; Bromus ciliatus; Campanula rotundifolia; Dalea*			
Muhlenbergia glomerata	1.0	*candida; Galium boreale; Platanthera hyperborea; Heuchera richardsonii;*			
Zizia sp.	1.0	*Hieracium canadense; Juncus balticus; Maianthemum canadense;*			
Agoseris glauca	0.5	*Melilotus* sp.*; Monarda fistulosa; Muhlenbergia cuspidata;*			
		Panicum leibergii; Pedicularis sp.*; Prenanthes alba; Prunella vulgaris;*			
Total herbaceous	38.3	*Rubus pubescens; Rudbeckia hirta; Smilax lasioneura;*			
Bare Ground	0.4	*Stachys palustris; Trifolium pratense; Agrostis stolonifera.*			
Moss & Lichen	0.8				
Litter	96.3	4 unidentified species			

Table 17 (d). Transect B1.

Herbaceous species	Cover %	Woody species	DDC	Median Ht. (m)	Co	%
Poa pratensis	16.0	*Populus tremuloides*	8	8		0
Fragaria virginiana	12.0	*Rhus radicans*	8	0.4		0
Aralia nudicaulis	8.5	*Symphoricarpos occidentalis*	4	0.7		5
Thalictrum sp.	7.5	*Amelanchier alnifolia*	5	1.5		10
Apocynum sp.	5.0	*Prunus virginiana*	4	2		10
Aster ciliolatus	4.0	*Betula pumila*	5	1.5		5
Galium boreale	3.0	*Cornus stolonifera*	5	2.5		5
Glycyrrhiza lepidota	2.5	*Populus balsamifera*	4	12		5
Sanicula marilandica	2.5	*Rosa* sp.	7	1.5		5
Lathyrus sp.	2.0	*Salix* spp	4	3		<5
Oryzopsis asperifolia	2.0	*Potentilla fruticosa*	2	0.5		T
Rubus pubescens	2.0					
Taraxacum officinale	1.5	Incidental observations				
Aster lateriflorus	1.5	*Anenome cylindrica; Bromus ciliatus; Campanula rotundifolia;*				
Bromus inermis	1.0	*Carex* spp*; Castilleja miniata; Cirsium sp.; Elymus sp.;*				
Calamagrostis sp.	1.0	*Equisetum* sp.*; Platanthera hyperborea; Lithospermum canescens;*				
Maianthemum canadense	1.0	*Lysmachia ciliata; Meliotus alba; Meliotus officinale; Muhlenbergia*				
Monarda fistulosa	1.0	*glomerata; Oenothera biennis; Polygala senega; Pyrola* sp.*;*				
Pedicularis sp.	1.0	*Rudbeckia hirta; Schizachne purpurascens; Smilax*				
Solidago canadensis	1.0	*lasioneura; Symphoricarpos occidentalis; Thalictrum*				
Solidago spp.	1.0	*dasycarpum; Thalictrum venulosum; Trifolium pratense;*				
unID composite (tall, glab)	1.0	*Trifolium repens.*				
unID forb (down, milk)	1.0					
Zizia aurea	1.0	2 unidentified species				
Bromus ciliatus	0.5					
Hieracium sp.	0.5					
Smilacina stellata	0.5					
unID forb (linear, milk)	0.5					
Total herbaceous	62.0					
Bare Ground	0.0					
Moss & Lichen	0.1					
Litter	97.5					

Table 17 (e). Transect B1a.

Herbaceous Species	Cover %	Woody Species	DDC	Med. ht (m)	Cover %
Poa pratensis	5.5	*Populus tremuloides*	8	15	80
Aster ciliolatus	3.0	*Amelanchier alnifolia*	6	1.5	10
Thalictrum dasycarpum	3.0	*Cornus stolonifera*	5	2	10
Oryzopsis asperifolia	2.5	*Betula pumila*	5	2	5
Achillea millefolium	1.5	*Prunus virginiana*	5	4	5
Fragaria virginiana	1.0	*Rosa* sp.	4	0.25	5
Rhus radicans	1.0	*Salix* sp.	4	2.5	5
Rubus pubescens	1.0	*Symphoricarpos occidentalis*	4	0.6	5
Sanicula marilandica	1.0	*Elaeagnus commutata*	2	1	<5
unID forb	1.0	*Potentilla fruticosa*	2	0.5	<5
		Rubus idaeus	2	0.5	<5
		Rubus pubescens	4	0.1	<5
Total herbaceous	19.5	*Quercus macrocarpa*	1	0.1	T
Bare Ground	0.0				
Litter	97.5				

Incidental observations

Agropyron trachycaulum var. *unilaterale; Anemone canadensis; Apocynum androsaemifolium; Aster* sp.; *Bromus ciliatus; Campanula rotundifolia; Carex* sp.; *Galium boreale; Glycyrrhiza lepidota; Lathyrus* sp.; *Lysimachia ciliata; Maianthemum canadense; Medicago lupulina; Monarda fistulosa; Panicum leibergii; Petasites palmatus; Rudbeckia hirta; Schizachne purpurascens; Solidago* sp.; *Taraxacum officinale; Viola* sp.; *Zizia aptera.*

3 unidentified forbs

Table 18. List of all species observed in Lakeview Community Pasture, Woodland habitat.

Acer negundo	*Dalea candida*	*Populus balsamifera*
Achillea millefolium	*Elaeagnus commutata*	*Populus tremuloides*
Actaea rubra	*Elymus canadensis*	*Potentilla fruticosa*
Agoseris glauca	*Equisetum* sp.	*Prenanthes alba*
Agropyron repens	*Erigeron philadelphicus*	*Prunella vulgaris*
Agropyron sp.	*Fragaria virginiana*	*Prunus pensylvanica*
Agropyron trachycaulum var. *unilaterale*	*Galium boreale*	*Prunus virginiana*
Agrostis scabra	*Glycyrrhiza lepidota*	*Puccinellia nuttalliana*
Agrostis stolonifera	*Heuchera richardsonii*	*Pyrola* sp.
Amelanchier alnifolia	*Hieracium canadense*	*Quercus macrocarpa*
Andropogon gerardii	*Hieracium* sp.	*Rhus radicans*
Andropogon scoparius	*Juncus balticus*	*Ribes oxycanthoides*
Anemone canadensis	*Lathyrus ochroleucus*	*Ribes* sp.
Anemone cylindrica	*Lathyrus* sp.	*Rosa* sp.
Antennaria parvifolia	*Lithospermum canescens*	*Rubus idaeus*
Antennaria spp.	*Lonicera dioica*	*Rubus pubescens*
Apocynum androsaemifolium	*Lysimachia ciliata*	*Rudbeckia hirta*
Apocynum sp.	*Maianthemum canadense*	*Salix* spp
Aralia nudicaulis	*Medicago lupulina*	*Sanicula marilandica*
Arctium lappa	*Meliotus alba*	*Schizachne purpurascens*
Arctostaphylos uva-ursi	*Meliotus officinale*	*Shepherdia canadensis*
Aster ciliolatus	*Monarda fistulosa*	*Smilacina stellata*
Aster ericoides	*Muhlenbergia cuspidata*	*Smilax lasioneura*
Aster laevis	*Muhlenbergia glomerata*	*Solidago canadensis*
Aster spp.	*Muhlenbergia racemosa*	*Solidago* spp.
Betula pumila	*Oenothera biennis*	*Stachys palustris*
Bromus ciliatus	*Oryzopsis asperifolia*	*Symphoricarpos occidentalis*
Bromus inermis	*Panicum leibergii*	*Taraxacum officinale*
Calamagrostis inexpansa	*Panicum virgatum*	*Thalictrum dasycarpum*
Calamagrostis sp.	*Pedicularis* sp.	*Thalictrum venulosum*
Campanula rotundifolia	*Petasites palmatus*	*Trifolium repens*
Carex spp.	*Plantago* sp.	*Ulmus americana*
Castilleja miniata	*Platanthera hyperborea*	*Vicia americana*
Cirsium sp.	*Poa pratensis*	*Viola* spp.
Cornus stolonifera	*Poa* sp.	*Zizia aptera*
Crateagus sp.	*Polygala senega*	*Zizia aurea*
		14 unidentified species

Appendix VI

Data summary for Westbourne Community Pasture, grassland habitat transects.
The estimated biomass (%) is averaged for ten quadrats for each species with a biomass >5%, occurring in at least one quadrat on the transect. The mean percent cover values of total herbaceous species, bare ground, moss/lichen and litter are averaged for the transect. No clubmoss was present in any quadrat of any transect. Incidental species observations include species observed at <5% on the transect and species in the habitat type in each field.

Table 19 (a)-(h). Grassland transect summary for Westbourne Community Pasture.

Table 19 (a). Transect C1.

Species	Biomass %	Incidental observations
Phalaris arundinacea	62.5	*Agropyron trachycaulum* var. *unilaterale*
Agropyron repens	12	*Calamagrostis inexpansa*
Eleocharis sp.	9	*Chenopodium album*
Potentilla anserina	8	*Grindelia squarrosa*
Carex sp.	3	*Juncus torreyi*
Calamagrostis sp.	2	*Poa palustris*
Polygonum sp.	1.5	*Ranunculus cymbalaria*
Muhlenbergia asperifolia	1	*Stachys palustris*
Hordeum jubatum	0.5	*Taraxacum officinale*
Solidago sp.	0.5	
Total herbaceous	45.3	
Bare Ground	7.8	
Litter	84.5	
Moss	0.0	

Table 19 (b). Transect C1(t2).

Species	Biomass %	Incidental observations
Potentilla anserina	26.5	*Asclepias speciosa*
Poa pratensis	17	*Aster ericoides*
Carex sp.	9.5	*Glycyrrhiza lepidota*
Phalaris arundinacea	7.5	*Hordeum jubatum*
Taraxacum officinale	7	*Juncus balticus*
Agropyron repens	6.5	*Lepidium* sp.
Eleocharis sp.	6	*Medicago lupulina*
Calamagrostis inexpansa	3.5	*Melilotus alba*
Aster junciformis	2.5	*Melilotus officinalis*
Grindelia squarrosa	2	*Mentha arvensis*
Cirsium arvense	1.5	*Orthocarpus luteus*
Lycopus asper	1.5	*Ranunculus* sp.
Muhlenbergia asperifolia	1.5	*Rumex* sp.
Cirsium flodmanii	1	*Solidago* sp.
Poa palustris	1	*Sonchus* sp.
Sonchus sp.	1	*Stachys palustris*
Ambrosia psilostachya	0.5	*Triglochin maritima*
Plantago sp.	0.5	
Total herbaceous	52.25	
Bare Ground	7.35	
Litter	64	
Moss	1.5	

Table 19 (c). Transect C1b.

Species	Biomass %	Incidental observations
Agropyron repens	34	*Artemisia campestris*
Poa pratensis	19.5	*Brassica* sp.
Potentilla anserina	18	*Calamagrostis inexpansa*
Phalaris arundinacea	10.5	*Juncus* sp.
Taraxacum officinale	3.8	*Mentha arvensis*
Medicago lupulina	3.7	*Orthocarpus luteus*
Eleocharis sp.	1.5	*Potentilla pensylvanica*
Bromus inermis	1.5	*Salix* sp.
Carex sp.	1	*Stachys palustris*
Grindelia squarrosa	0.7	*Stipa* sp.
Plantago eriopoda	0.5	*Symphoricarpos occidentalis*
Muhlenbergia asperifolia	0.5	
Aster ericoides	0.5	
		1 unidentified forb
Total herbaceous	70.3	
Bare Ground	5.1	
Litter	71.0	
Moss	16.6	

Table 19 (d). Transect C3.

Species	Biomass %	Incidental observations
Poa pratensis	18	*Astragalus* sp.
Carex sp.	16	*Brassica* sp.
Potentilla fruticosa	15	*Carex aurea*
Taraxacum officinale	11	*Erigeron lonchophyllus*
Bromus inermis	7.8	*Juncus* sp.
Agropyron repens	6.5	*Melilotus alba*
Aster junciformis	4.5	*Mentha arvensis*
Poa compressa	3.4	*Orthocarpus luteus*
Muhlenbergia asperifolia	2.5	*Phleum pratense*
Cirsium flodmanii	2	*Plantago eriopoda*
Aster ericoides	1.5	*Rosa* sp.
Crepis tectorum	1.5	*Solidago* sp.
Grindelia squarrosa	1.5	*Poa canbyi ?*
Festuca eliator	0.5	
Eleocharis sp.	0.5	
Juncus balticus	0.5	
Lycopus asper	0.5	
Polygonum sp.	0.5	
Stachys palustris	0.5	
Stipa sp.	0.5	
Total herbaceous	51.3	
Bare Ground	5.6	
Litter	62.0	
Moss	1.5	

Table 19 (e). Transect C3a.

Species	Biomass %	Incidental observations
Bromus inermis	51	*Achillea millefolium*
Poa pratensis	28	*Calamagrostis canadensis*
Aster ericoides	6.5	*Carex* sp.
Melilotus officinalis	4.5	*Cirsium* sp.
Agropyron repens	2.5	*Grindelia squarrosa*
Ambrosia psilostachya	2	*Hordeum jubatum*
		Juncus sp.
Total herbaceous	38	*Melilotus alba*
Bare Ground	38.6	*Muhlenbergia asperifolia*
Litter	57.5	*Phleum pratense*
Moss	0	*Poa compressa*
		Potentilla anserina
		Taraxacum officinale
		1 unidentified forb

Table 19 (f). Transect C4.

Species	Biomass %	Incidental observations
Potentilla anserina	20	*Antennaria* sp.
Poa pratensis	19.5	*Achillea millefolium*
Carex sp.	18.5	*Ambrosia psilostachya*
Taraxacum officinale	11.5	*Asclepias speciosa*
Agropyron repens	8.5	*Aster ericoides*
Eleocharis sp.	6	*Glaux maritima*
Muhlenbergia asperifolia	4.2	*Glycyrrhiza lepidota*
Potentilla sp.	2	*Grindelia squarrosa*
Aster junciformis	1.5	*Hordeum jubatum*
Agropyron trachycaulum	1	*Melilotus alba*
Juncus sp.	1	*Melilotus officinalis*
Lactuca tatarica	1	*Orthocarpus luteus*
Cirsium sp.	0.5	*Plantago eriopoda*
Lycopus asper	0.5	*Stachys palustris*
Medicago lupulina	0.5	
Total herbaceous	56.75	
Bare Ground	8.45	
Litter	54.5	
Moss	1.8	

Table 19 (g). Transect C4a.

Species	Biomass %	Incidental observations
Poa pratensis	49.5	*Achillea millefolium*
Carex sp.	19	*Agropyron elongatum*
Agropyron repens	7	*Beckmannia syzigachne*
Bromus inermis	5.5	*Cirsium* sp.
Solidago canadensis	4.5	*Grindelia squarrosa*
Ambrosia psilostachya	3	*Hordeum jubatum*
Solidago sp.	2.5	*Medicago lupulina*
Aster ericoides	2.2	*Melilotus officinalis*
Trifolium sp.	1.5	*Muhlenbergia asperifolia*
Antennaria sp.	1	*Potentilla anserina*
Melilotus alba	1	*Ranunculus cymbalaria*
Plantago sp.	1	*Taraxacum officinale*
Agropyron smithii	0.5	*Triglochin maritima*
Cirsium flodmanii	0.5	
Total herbaceous	68.8	
Bare Ground	13.5	
Litter	40.0	
Moss	0.0	

Table 19 (h). Transect C4b.

Species	Biomass %	Incidental observations
Poa pratensis	38.5	*Bromus inermis*
Carex sp.	13.5	*Campanula rotundifolia*
Solidago spathula	9.5	*Hordeum jubatum*
Ambrosia psilostachya	4.5	*Medicago lupulina*
Distichlis stricta	4.5	*Melilotus alba*
Melilotus officinalis	4	*Oenothera biennis*
Agropyron trachycaulum	3.5	*Orthocarpus luteus*
Cirsium flodmanii	3.5	*Potentilla anserina*
Grindelia squarrosa	2	*Potentilla pensylvanica*
Solidago rigida	2	*Rosa* sp.
Anemone cylindrica	1.5	*Solidago canadensis*
Achillea millefolium	1	*Stachys palustris*
Aster ericoides	1	*Symphoricarpos occidentalis*
Koeleria cristata	1	*Taraxacum officinale*
Muhlenbergia asperifolia	1	*Viola* sp.
unID forb (lance glabr)	1	
Antennaria sp.	0.5	2 unidentified forbs
Astragalus sp.	0.5	
Total herbaceous	64.5	
Bare Ground	5.15	
Litter	84.25	
Moss	0.9	

Table 20. List of all plant species observed in Westbourne Community Pasture, Grassland habitat.

Achillea millefolium	*Cirsium flodmanii*	*Plantago* sp.
Agropyron elongatum	*Cirsium* sp.	*Poa compressa*
Agropyron repens	*Crepis tectorum*	*Poa palustris*
Agropyron smithii	*Distichlis stricta*	*Poa pratensis*
Agropyron trachycaulum	*Eleocharis* sp.	*Poa* sp.
Agropyron trachycaulum var. *unilaterale*	*Erigeron lonchophyllus*	*Polygonum* sp.
Ambrosia psilostachya	*Festuca eliator*	*Potentilla anserina*
Anemone cylindrica	*Glaux maritima*	*Potentilla fruticosa*
Antennaria parvifolia	*Glycyrrhiza lepidota*	*Potentilla pensylvanica*
Antennaria sp.	*Grindelia squarrosa*	*Potentilla* sp.
Artemisia campestris	*Hordeum jubatum*	*Ranunculus cymbalaria*
Asclepias speciosa	*Juncus balticus*	*Ranunculus* sp.
Aster ericoides	*Juncus* sp.(unID star)	*Rosa* sp.
Aster junciformis	*Juncus torreyi*	*Rumex* sp.
Astragalus sp.	*Koeleria cristata*	*Salix* sp.
Beckmannia syzigachne	*Lactuca tatarica*	*Solidago canadensis*
Brassica sp.	*Lepidium densiflorum*	*Solidago rigida*
Bromus inermis	*Lycopus asper*	*Solidago* sp.
Calamagrostis canadensis	*Medicago lupulina*	*Solidago spathulata*
Calamagrostis inexpansa	*Melilotus alba*	*Sonchus* sp.
Calamagrostis sp.	*Melilotus officinalis*	*Stachys palustris*
Campanula rotundifolia	*Mentha arvensis*	*Stipa* sp.
Carex aurea	*Muhlenbergia asperifolia*	*Symphoricarpos occidentalis*
Carex lanuginosa	*Oenothera biennis*	*Taraxacum officinale*
Carex praegracilis	*Orthocarpus luteus*	*Trifolium* sp.
Carex sp.	*Phalaris arundinacea*	*Triglochin maritima*
Chenopodium album	*Phleum pratense*	*Viola* sp.
Cirsium arvense	*Plantago eriopoda*	
		5 unidentified forbs

Appendix VII

Data summary for Westbourne Community Pasture, wetland habitat transects.
The estimated biomass (%) is averaged for ten quadrats for each species with a biomass >5%, occurring in at least one quadrat on the transect. The mean percent cover values of total herbaceous species, bare ground, moss/lichen and litter are averaged for the transect. No clubmoss was present in any quadrat of any transect. Incidental species observations include species observed at <5% on the transect and species in the habitat type in each field.

Table 21 (a)-(e). Wetland transect summary for Westbourne Community Pasture.

Table 21 (a). Transect C1.

Species	Biomass %	Incidental observations
Phalaris arundinacea	69.2	*Chenopodium album*
Carex sp.	11	*Lemna minor*
Typha latifolia	9	*Ranunculus sceleratus*
Alisma plantago-aquatica	5	*Scirpus pallidus*
Sium suave	4	*Scirpus validus*
Utricularia vulgaris	1	*Sium suave*
Beckmania syzigachne	0.5	
Total herbaceous	24	
Bare Ground	0.3	
Moss	0	
Litter	1.5	

Table 21 (b). Transect C1b.

Species	Biomass %	Incidental observations
Eleocharis sp.	37.5	*Lemna minor*
Phalaris arundinacea	19.5	*Poa palustris*
Carex sp.	14	*Ranunculus cymbalaria*
Lycopus asper	6	*Ranunculus pensylvanicus*
Potentilla anserina	5.5	*Ranunculus scleratus*
Beckmannia syzigachne	4.5	*Rumex* sp.
Mentha arvensis	3	*Salix* sp.
Agropyron repens	2.5	*Typha latifolia*
Aster junciformis	1.5	
Scirpus validus	1.5	1 unidentified forb
Alisma plantago-aquatica	1	
Calamagrostis canadensis	0.5	
Hordeum jubatum	0.5	
Total herbaceous	40.3	
Bare Ground	3.3	
Litter	33.0	
Moss	7.4	

Table 21 (c). Transect C3.

Species	Biomass %	Incidental observations
Phalaris arundinacea	38	*Alisma plantago-aquatica*
Carex sp.	32.5	*Beckmannia syzigachne*
Eleocharis sp.	16.5	*Hordeum jubatum*
Potentilla anserina	6.5	*Juncus* sp. (star)
Calamagrostis sp.	2	*Lycopus asper*
Aster junciformis	1	*Poa palustris*
Agropyron repens	0.5	*Polygonum amphibium*
Muhlenbergia asperifolia	0.5	*Ranunculus* sp.
		Rumex sp.
Total herbaceous	45	*Scirpus validus*
Bare Ground	5.25	*Sparganium eurycarpum*
Moss	0	*Triglochin maritima*
Litter	39.05	

Table 21 (d). Transect C4.

Species	Biomass %	Incidental observations
Carex sp.	53.5	*Alisma plantago-aquatica*
Eleocharis sp.	25	*Carex laeviconica*
Scirpus validus	17	*Carex lanuginosa*
Calamagrostis sp.	0.5	*Hordeum jubatum*
Sium suave	0.5	*Juncus* sp. star
Triglochin maritima	0.5	*Lycopus asper*
unID forb (arrow leaves)	0.5	*Potentilla anserina*
		Sium suave
Total herbaceous	33	*Typha latifolia*
Bare Ground	0	*Utricularia vulgaris*
Litter	7.55	
Moss	1.8	

Table 21 (e). Transect C4b.

Species	Biomass %	Incidental observations
Carex sp.	66	*Beckmannia syzigachne*
Phalaris arundinacea	22	*Lemna minor*
Eleocharis spp.	6	*Lycopus asper*
Scirpus validus	3.5	*Poa palustris*
Alisma plantago-aquatica	2	*Sium suave*
		Stachys palustris
Total herbaceous	45.25	*Typha latifolia*
Bare Ground	0	*Utricularia vulgaris*
Litter	6.6	
Moss & Lichen	0.3	

Table 22. List of all plant species observed in Westbourne Community Pasture, Wetland habitat.

Agropyron repens	*Hordeum jubatum*	*Salix* sp.
Alisma plantago-aquatica	*Hypoxis hirsuta*	*Scirpus pallidus*
Aster junciformis	*Juncus* sp. (star)	*Scirpus validus*
Beckmannia syzigachne	*Lemna minor*	*Sium suave*
Calamagrostis canadensis	*Lycopus asper*	*Sparganium eurycarpum*
Calamagrostis sp.	*Mentha arvensis*	*Stachys palustris*
Carex laeviconia	*Muhlenbergia asperifolia*	*Triglochin maritima*
Carex lanuginosa	*Petasites sagittatus*	*Typha latifolia*
Carex lassiocarpa	*Phalaris arundinacea*	*Utricularia vulgaris*
Carex parryana	*Poa palustris*	
Carex sp.	*Polygonum* sp.	
Carex utriculata	*Potentilla anserina*	
Chenopodium sp.	*Ranunculus cymbalaria*	
Eleocharis elliptica	*Ranunculus pensylvanicus*	
Eleocharis smallii	*Ranunculus sceleratus*	
Eleocharis spp.	*Ranunculus* sp.	
Glaux maritima	*Rumex* sp.	

Appendix VIII

All bird species observed in grassland, wetland and forested habitats of the Lakeview and Westbourne Community Pastures.

Table 23 (a)-(c). Bird species observed in Lakeview Community Pasture.

Table 23 (a). List of all bird species observed in the grassland habitat, Lakeview Community Pastures.

American coot	Common snipe	Red-winged blackbird
American crow	Eastern bluebird	Ring-billed gull
American goldfinch	Eastern kingbird	Savannah sparrow
American white pelican	Franklin's gull	Sedge wren
Bald eagle	Grey catbird	Song sparrow
Barn swallow	Killdeer	Sora
Black-billed cuckoo	Least flycatcher	Upland sandpiper
Black tern	Mallard	Vesper sparrow
Blue-winged teal	Marbled godwit	Warbling vireo
Bobolink	Marsh wren	Western kingbird
Brown thrasher	Mountain bluebird	Western meadowlark
Clay-coloured sparrow	Mourning dove	Yellow warbler
Common grackle		

Table 23 (b). List of all bird species observed in the wetland habitat, Lakeview Community Pasture.

American bittern	Common yellowthroat	Red-tailed hawk
American coot	Forster's tern	Red-winged blackbird
American crow	Franklin's gull	Ring-billed gull
American robin	Grey catbird	Sandhill crane
American white pelican	Killdeer	Savannah sparrow
Barn swallow	Least flycatcher	Sedge wren
Black tern	Lesser yellow legs	Song sparrow
Black-billed cuckoo	Mallard	Sora
Black-crowned night-heron	Marbled godwit	Swamp sparrow
Blue-winged teal	Marsh wren	Tree swallow
Bobolink	Mourning dove	Veery
Cedar waxwing	Nelson's sharp-tailed sparrow	Warbling vireo
Clay-coloured sparrow	Northern shoveller	Western meadowlark
Cliff swallow	Pied-billed grebe	Yellow-headed blackbird
Common snipe	Red-eyed vireo	

Table 23 (c). List of all bird species observed in the woodland habitat, Lakeview Community Pasture.

Alder flycatcher	Eastern kingbird	Red-tailed hawk
American crow	Eastern towhee	Red winged blackbird
American redstart	Eastern wood-peewee	Rose-breasted grosbeak
American robin	Grey catbird	Ruffed grouse
Bald eagle	Hermit thrush	Sedge wren
Black-capped chickadee	House wren	Song sparrow
Blue jay	Least flycatcher	Veery
Chestnut-sided warbler	Mallard	Warbling vireo
Clay-coloured sparrow	Mourning dove	Western kingbird
Common raven	Northern oriole	White-throated sparrow
Common snipe	Ovenbird	Yellow-headed blackbird
Downy woodpecker	Red-eyed vireo	Yellow warbler

Table 24 (a)-(b). Bird species observed in Westbourne Community Pasture.

Table 24 (a). List of all bird species observed in the grassland habitat, Westbourne Community Pastures.

American coot	Nelson's sharp-tailed sparrow	Trumpeter swan
American white pelican	Northern pintail	Upland sandpiper
Blue-winged teal	Red-winged blackbird	Vesper sparrow
Bobolink	Ring-billed gull	Western meadowlark
Brown-headed cowbird	Sandhill crane	Willet
Clay-coloured sparrow	Savannah sparrow	Yellow rail
Common snipe	Sedge wren	
Franklin's gull	Short-eared owl	
Killdeer	Song sparrow	
Marsh wren	Sora	

Table 24 (b). List of all bird species observed in the wetland habitat, Westbourne Community Pasture.

American bittern	Forster's tern	Sandhill crane
American coot	Franklin's gull	Savannah sparrow
American white pelican	Lesser yellow legs	Sedge wren
Black tern	Marsh wren	Short-eared owl
Black-billed cuckoo	Nelson's sharp-tailed sparrow	Song sparrow
Black-crowned night-heron	Northern pintail	Sora
Blue-winged teal	Red-winged blackbird	Trumpeter swan
Clay-coloured sparrow	Ring-billed gull	Western meadowlark
Common yellowthroat		

Appendix IX

Orthophoto descriptions of vegetation transect and bird point count locations, Lakeview and Westbourne Community Pastures.

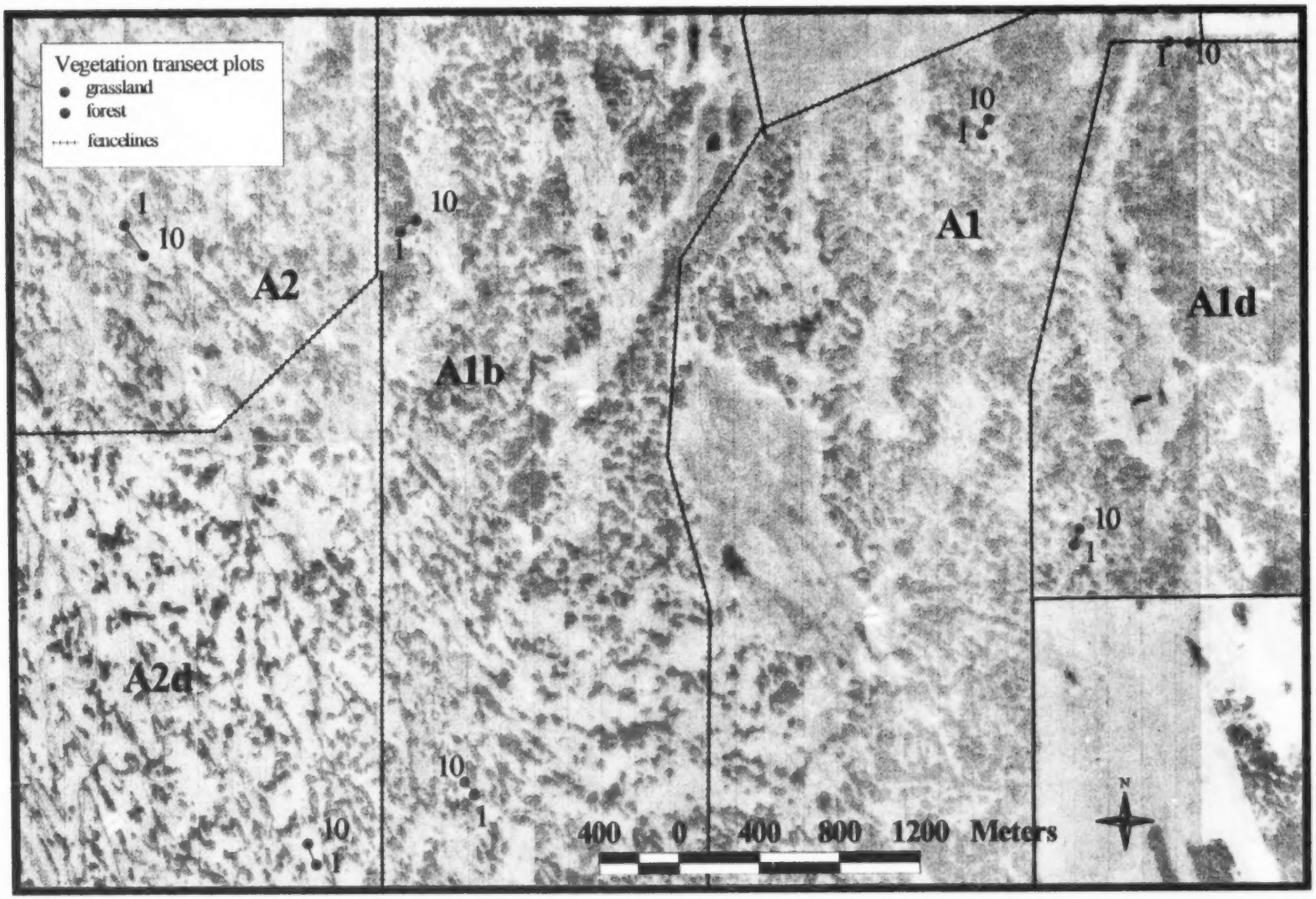

Figure 3. Vegetation transect plots (showing first and last plot of each line transect) in fields A1, A1b, A1d, A2, and A2d.

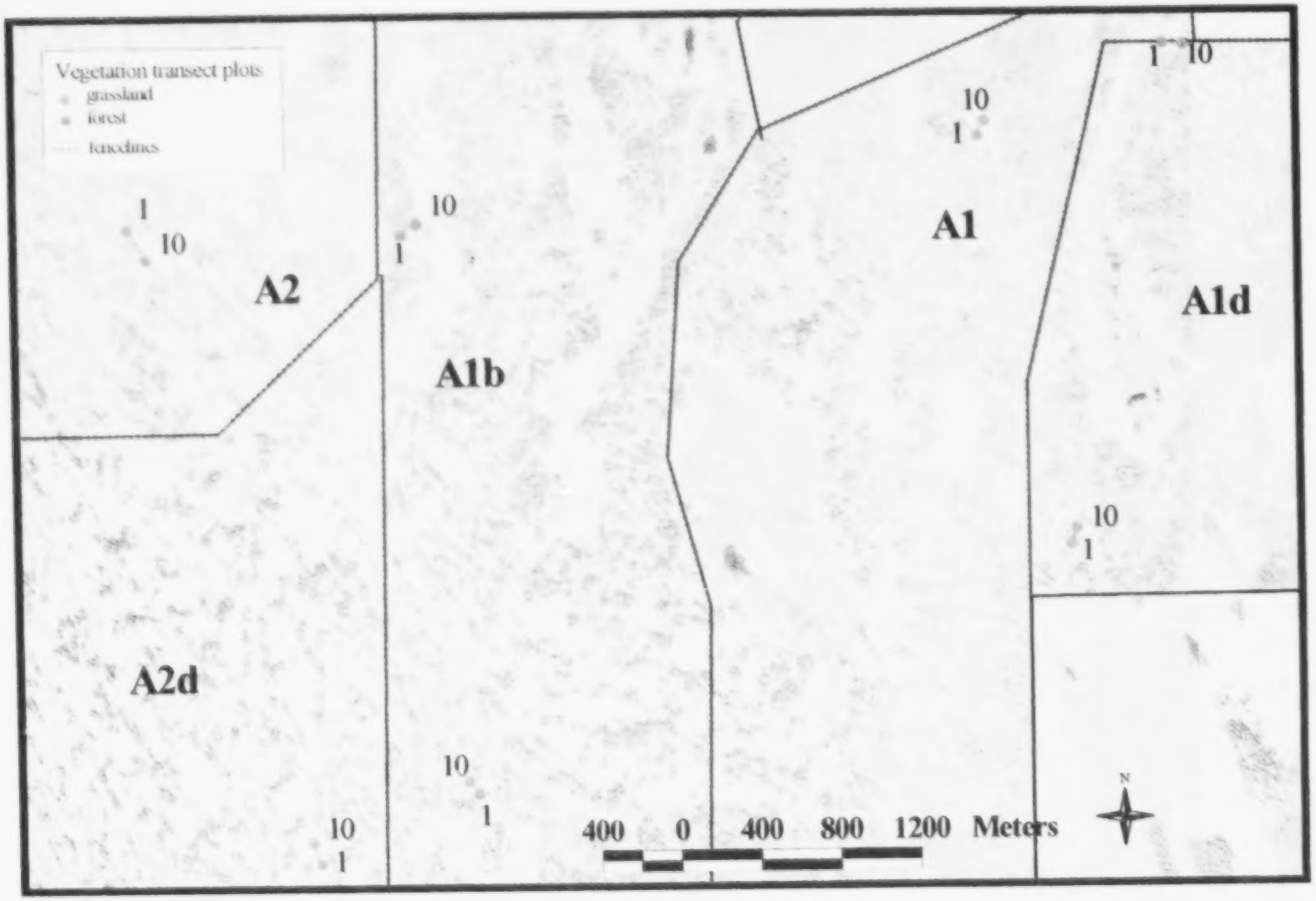

Figure 3. Vegetation transect plots (showing first and last plot of each line transect) in fields A1, A1b, A1d, A2, and A2d.

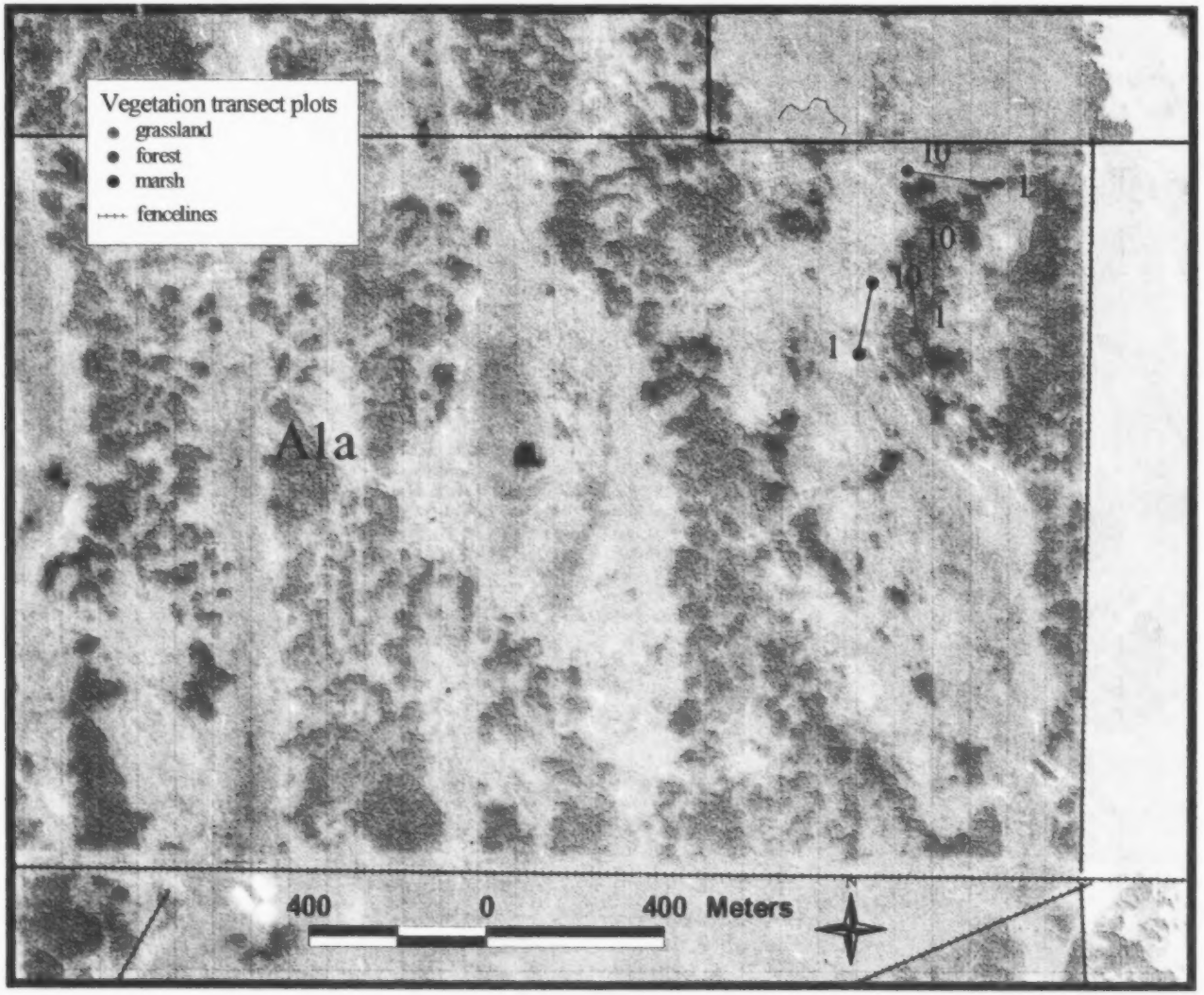

Figure 4. Vegetation transect plots (showing first and last plot of each line transect) in field A1a.

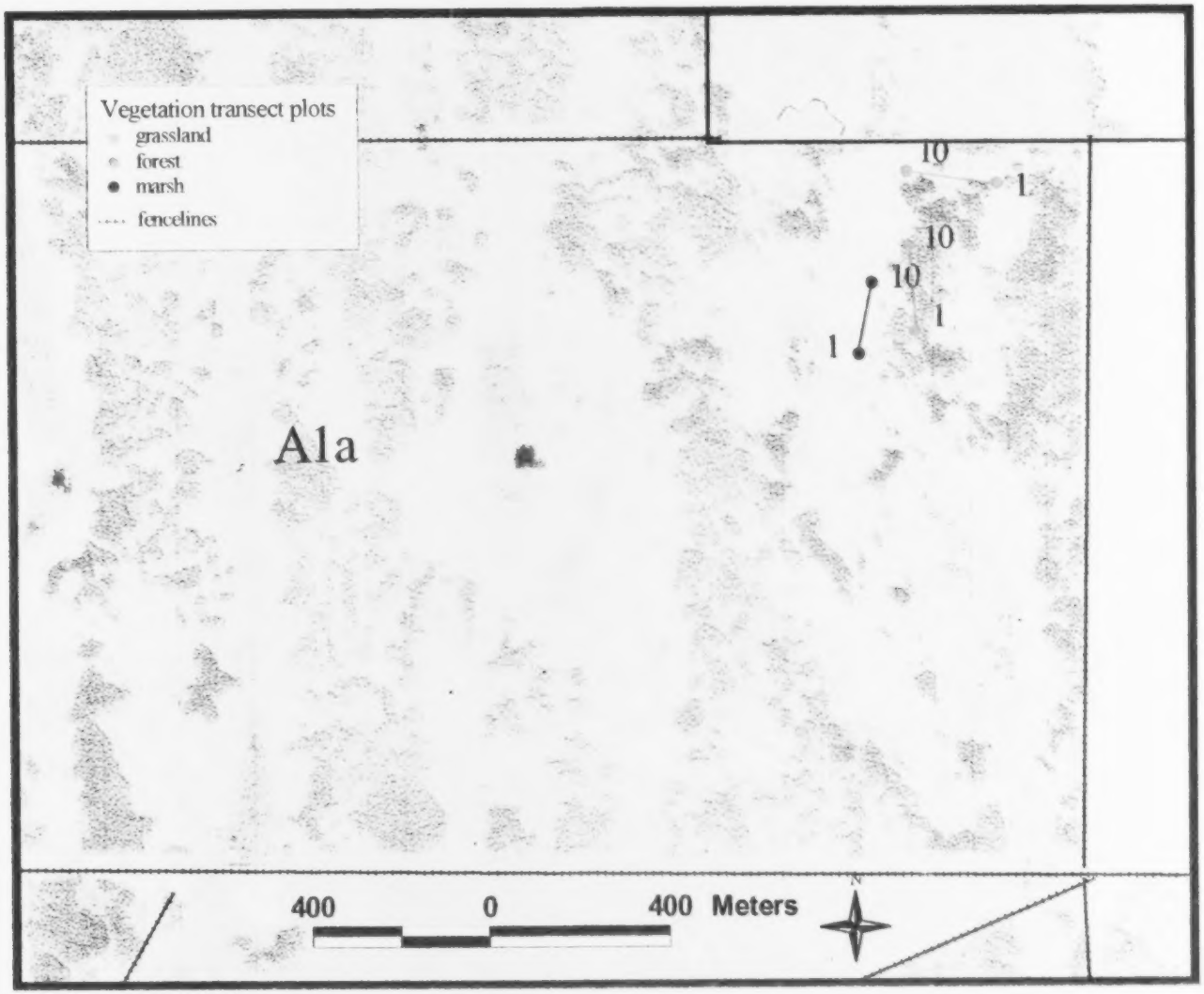

Figure 4. Vegetation transect plots (showing first and last plot of each line transect) in field A1a.

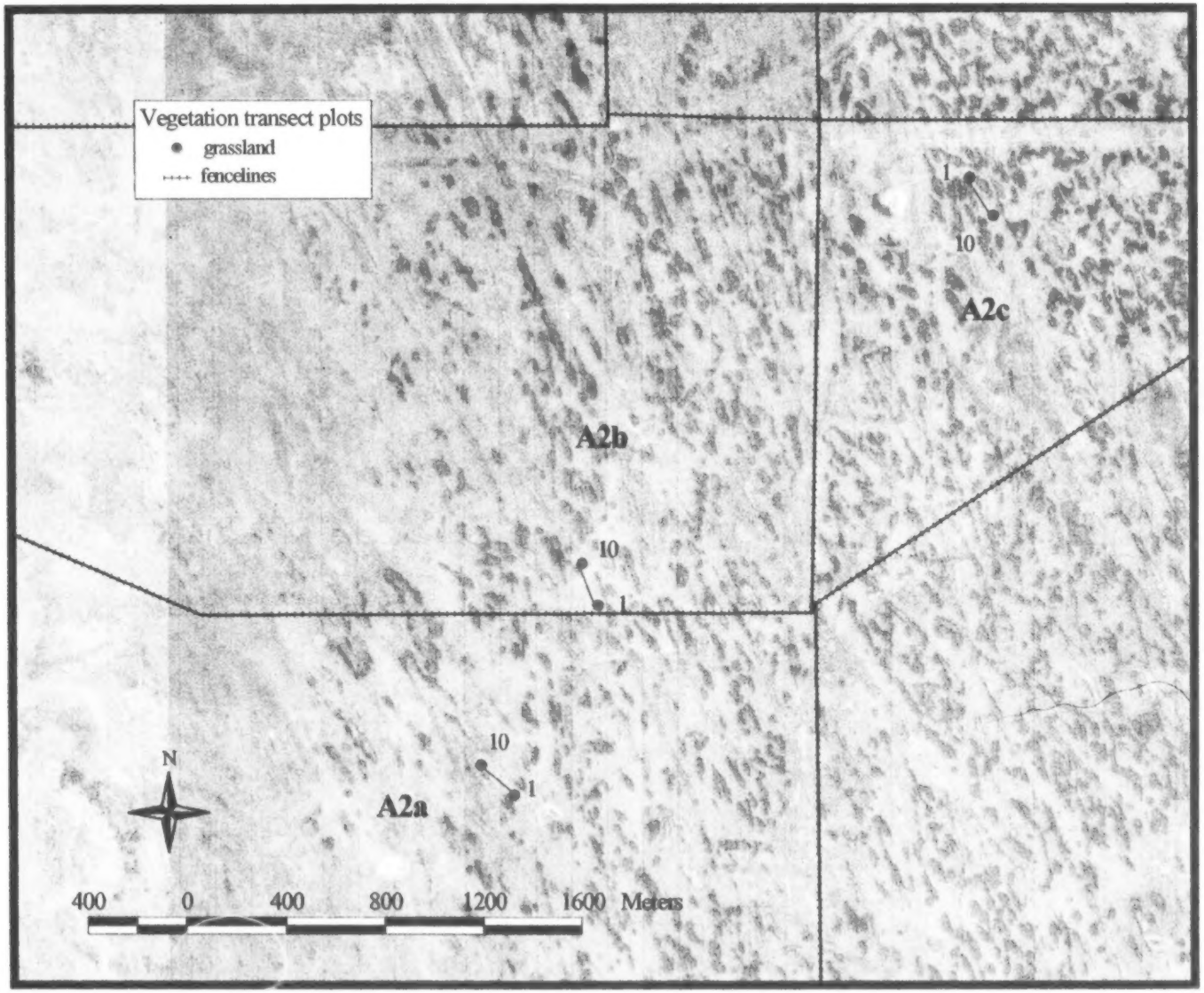

Figure 5. Vegetation transect plots (showing first and last plot for each line transect) in fields A2a, A2b and A2c.

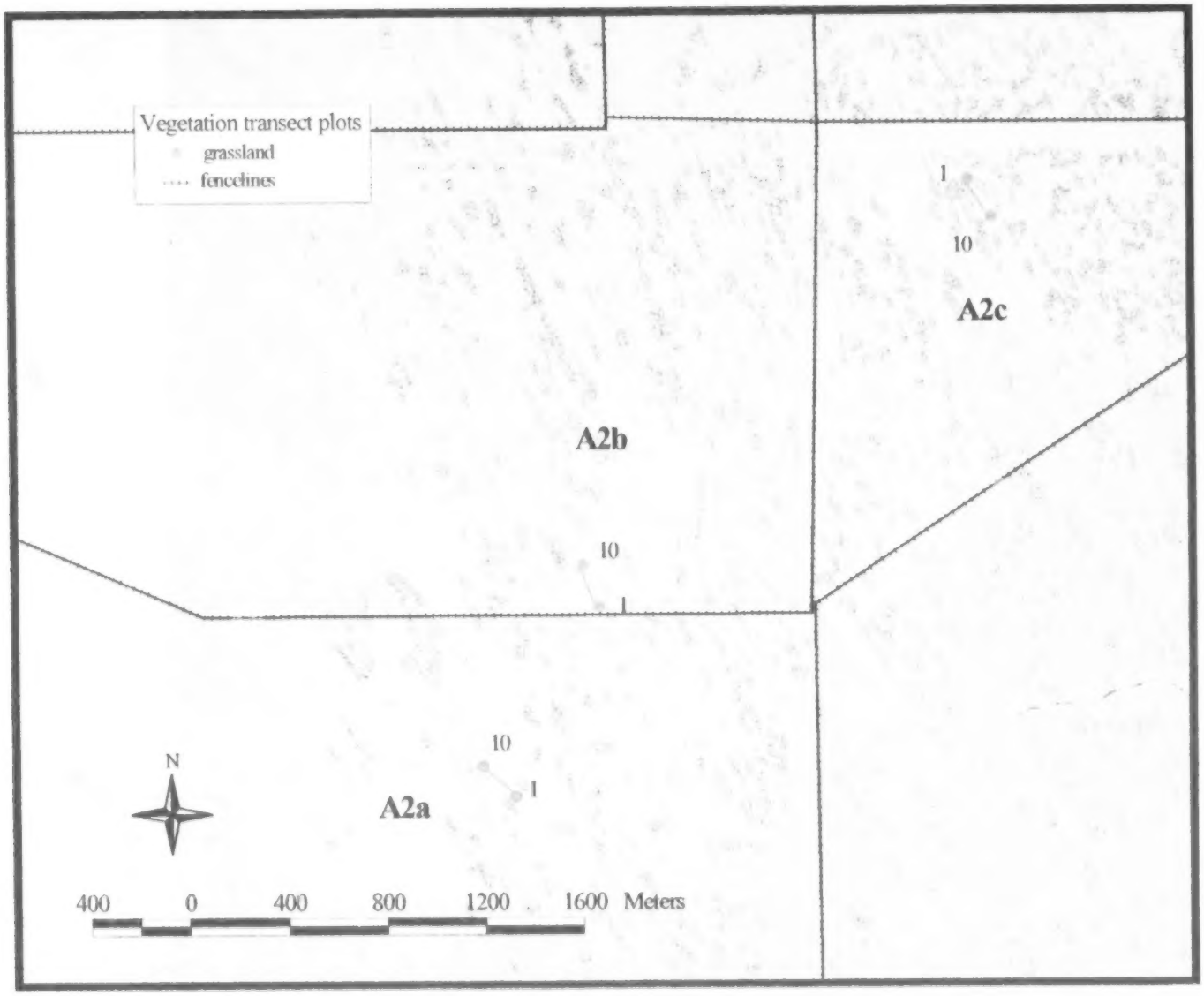

Figure 5. Vegetation transect plots (showing first and last plot for each line transect) in fields A2a, A2b and A2c.

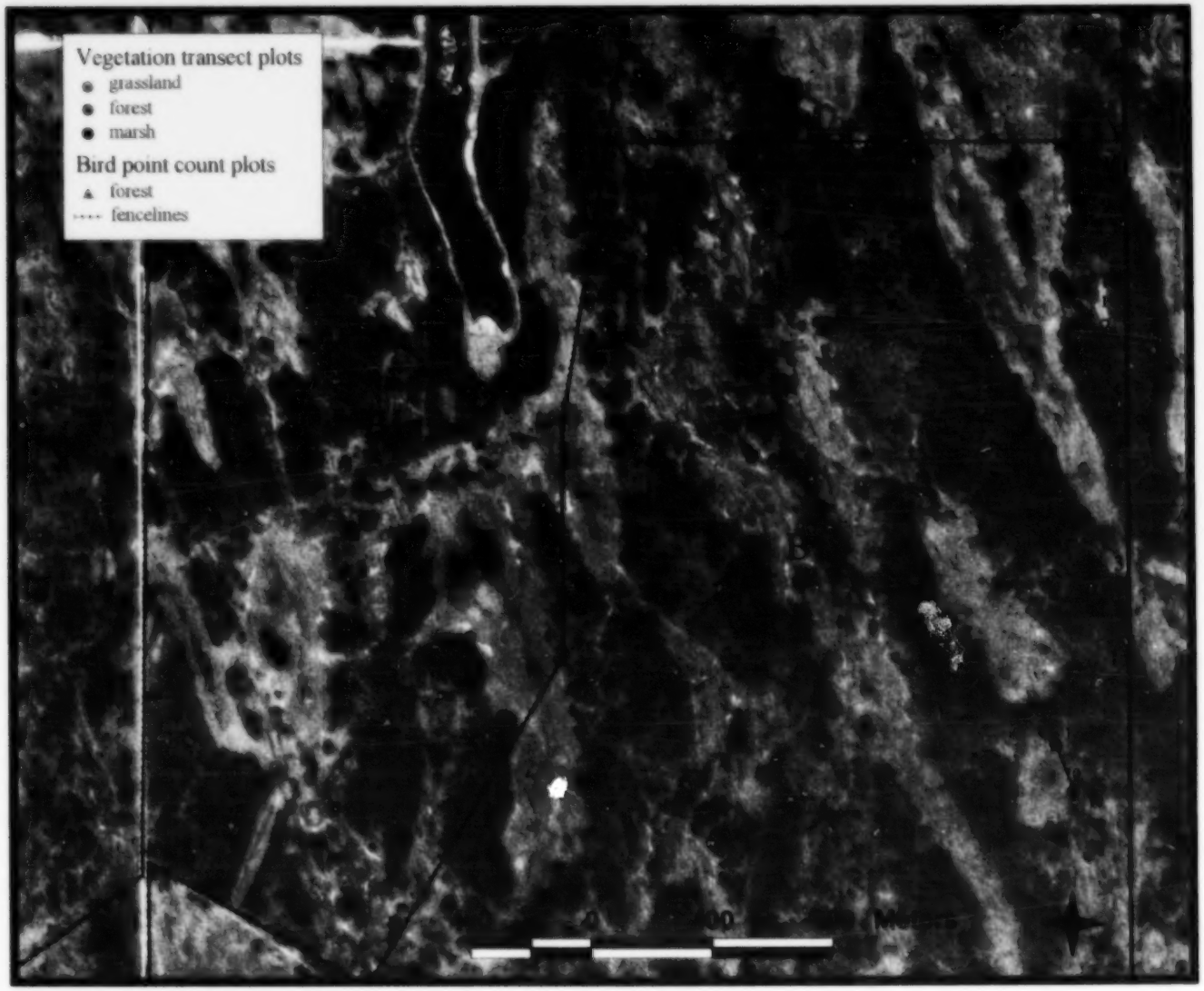

Figure 6. Vegetation transect plots (showing first and last plot for each line transect) and bird point count plots in fields B1 and B1a

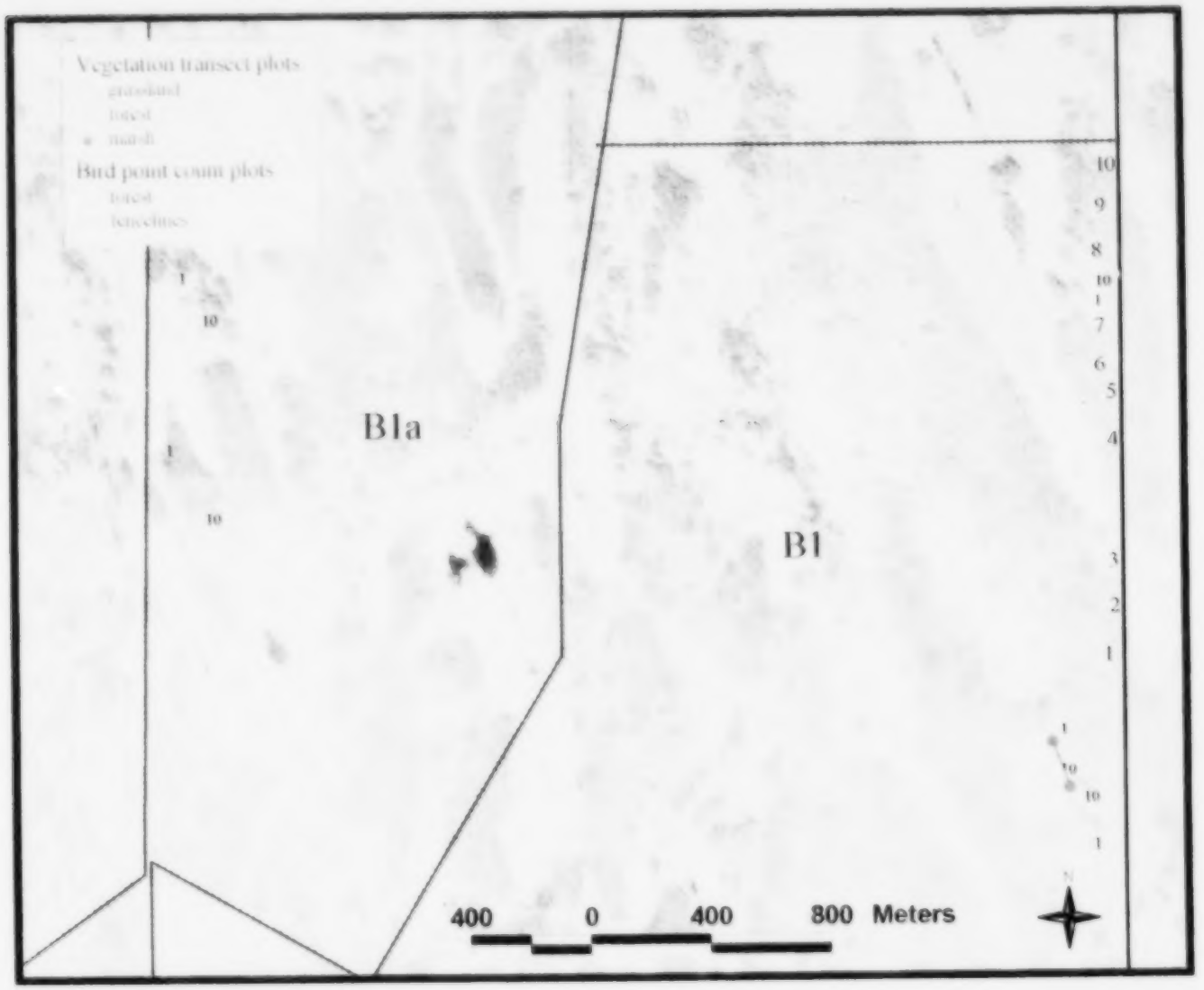

Figure 6. Vegetation transect plots (showing first and last plot for each line transect) and bird point count plots in fields B1 and B1a

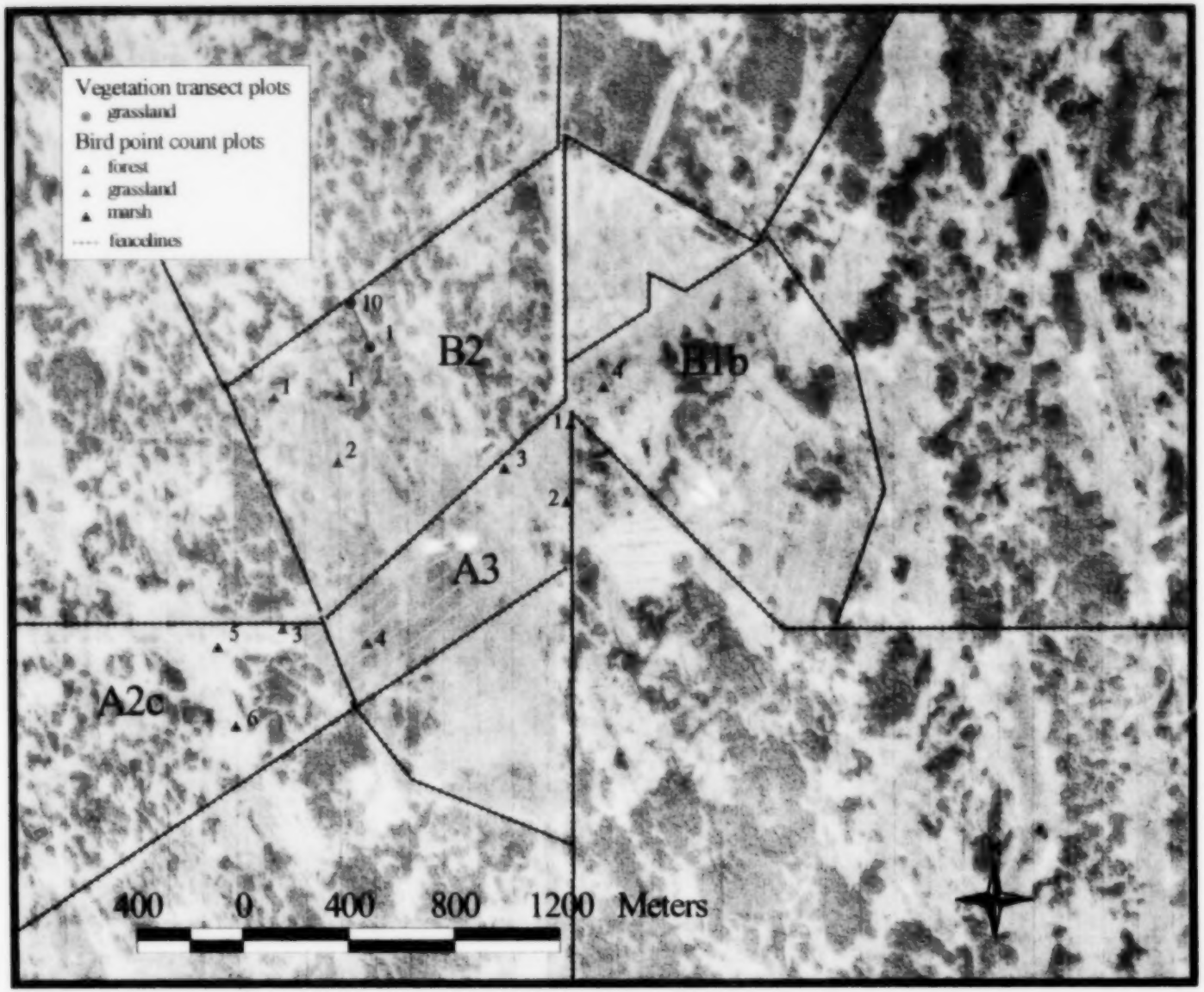

Figure 7. Vegetation transect plots (showing first and last plot for each line transect) and bird point count plots in fields B2, B1b, A3 and A2c.

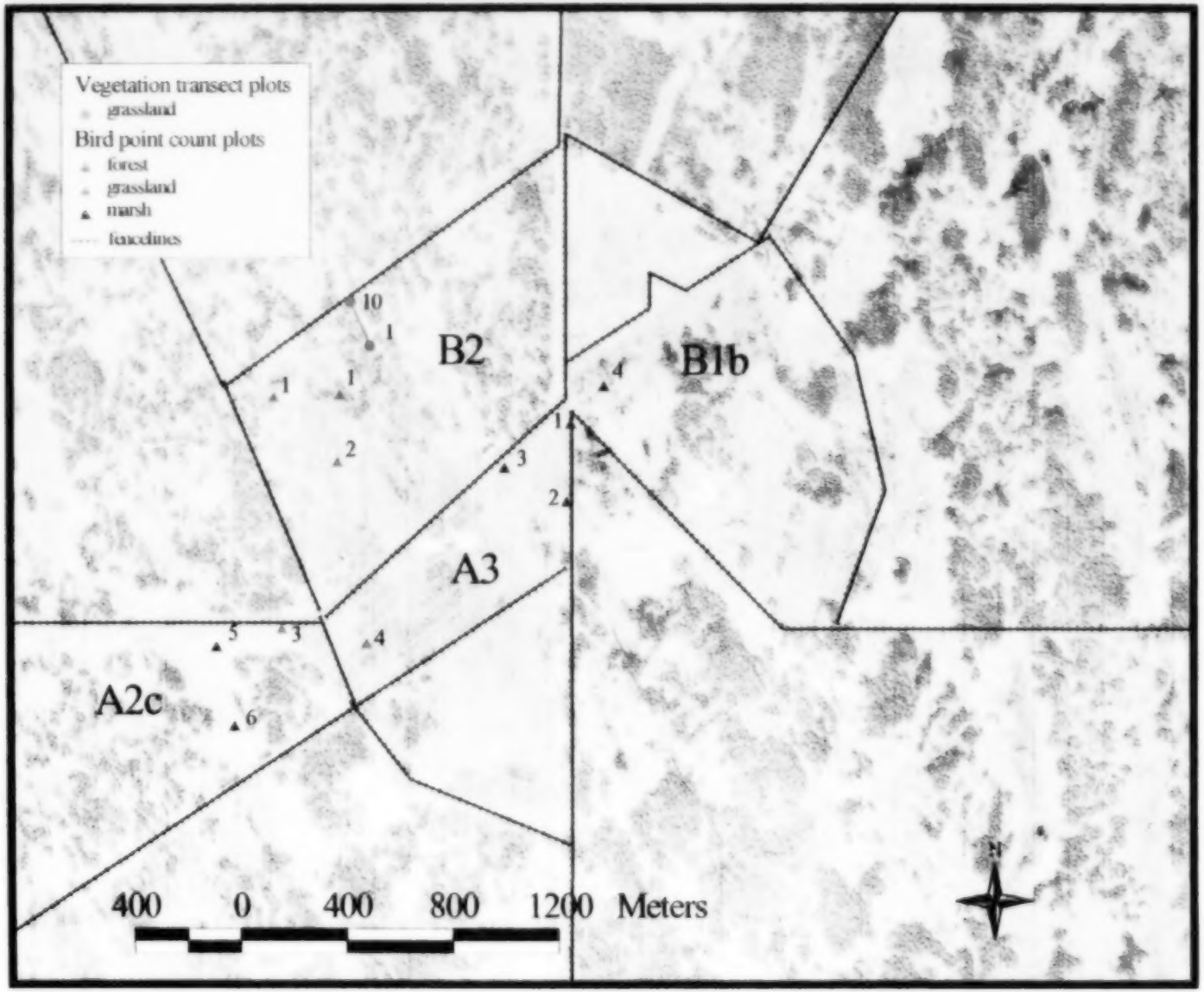

Figure 7. Vegetation transect plots (showing first and last plot for each line transect) and bird point count plots in fields B2, B1b, A3 and A2c.

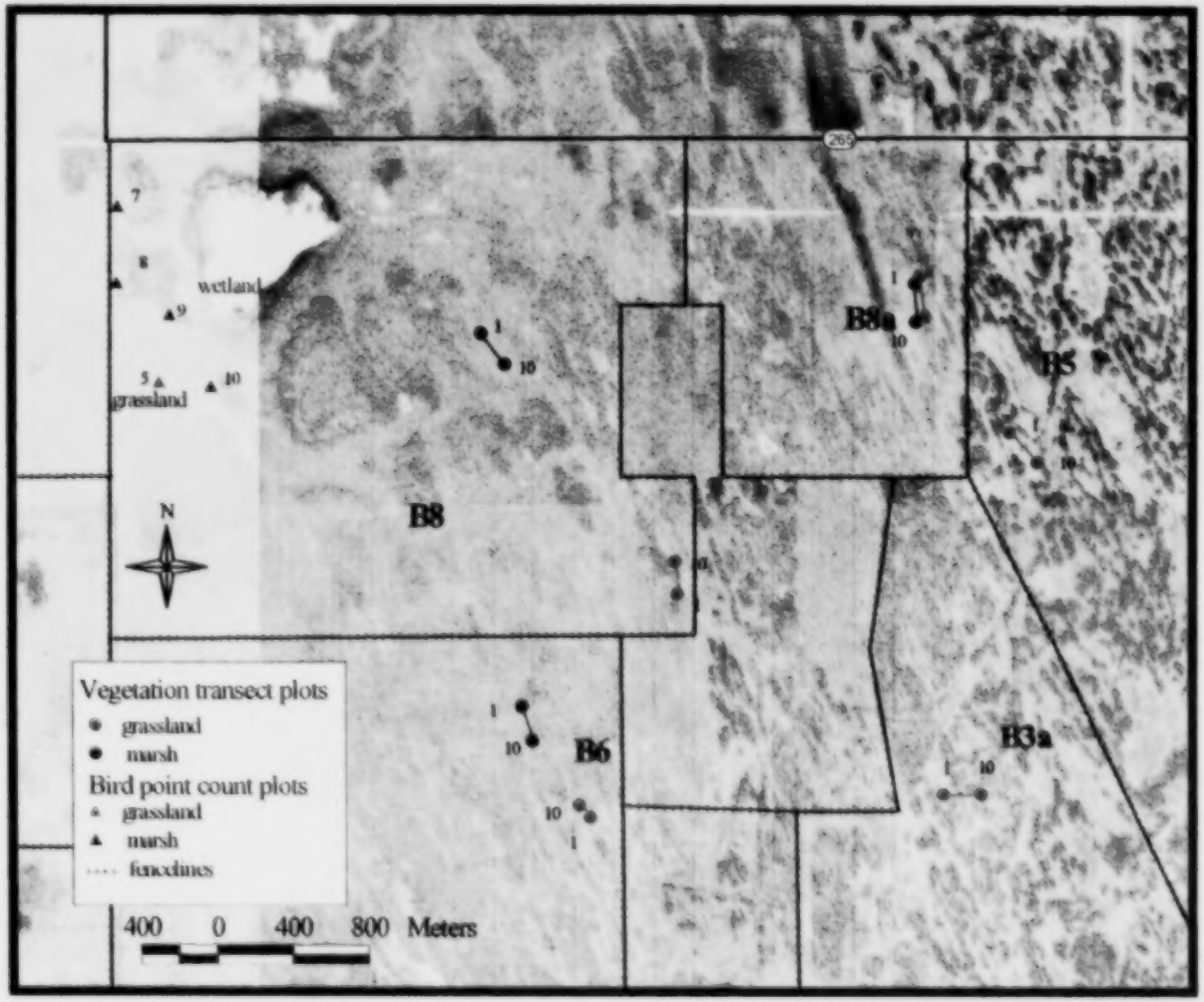

Figure 8. Vegetation transect plots (showing first and last plot for each line transect) and bird point count plots in fields B3a, B5, B6, B8, and B8a

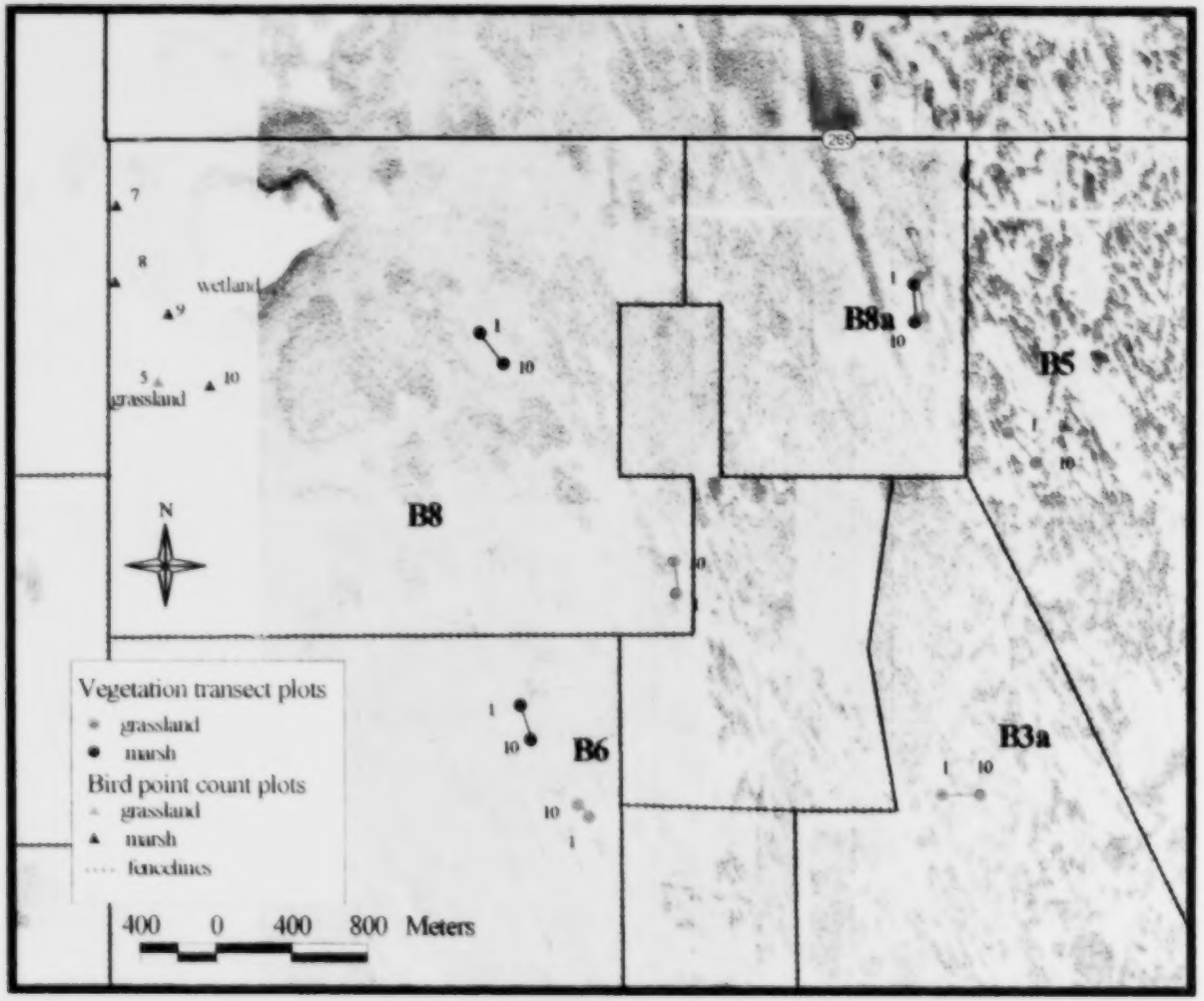

Figure 8. Vegetation transect plots (showing first and last plot for each line transect) and bird point count plots in fields B3a, B5, B6, B8, and B8a.

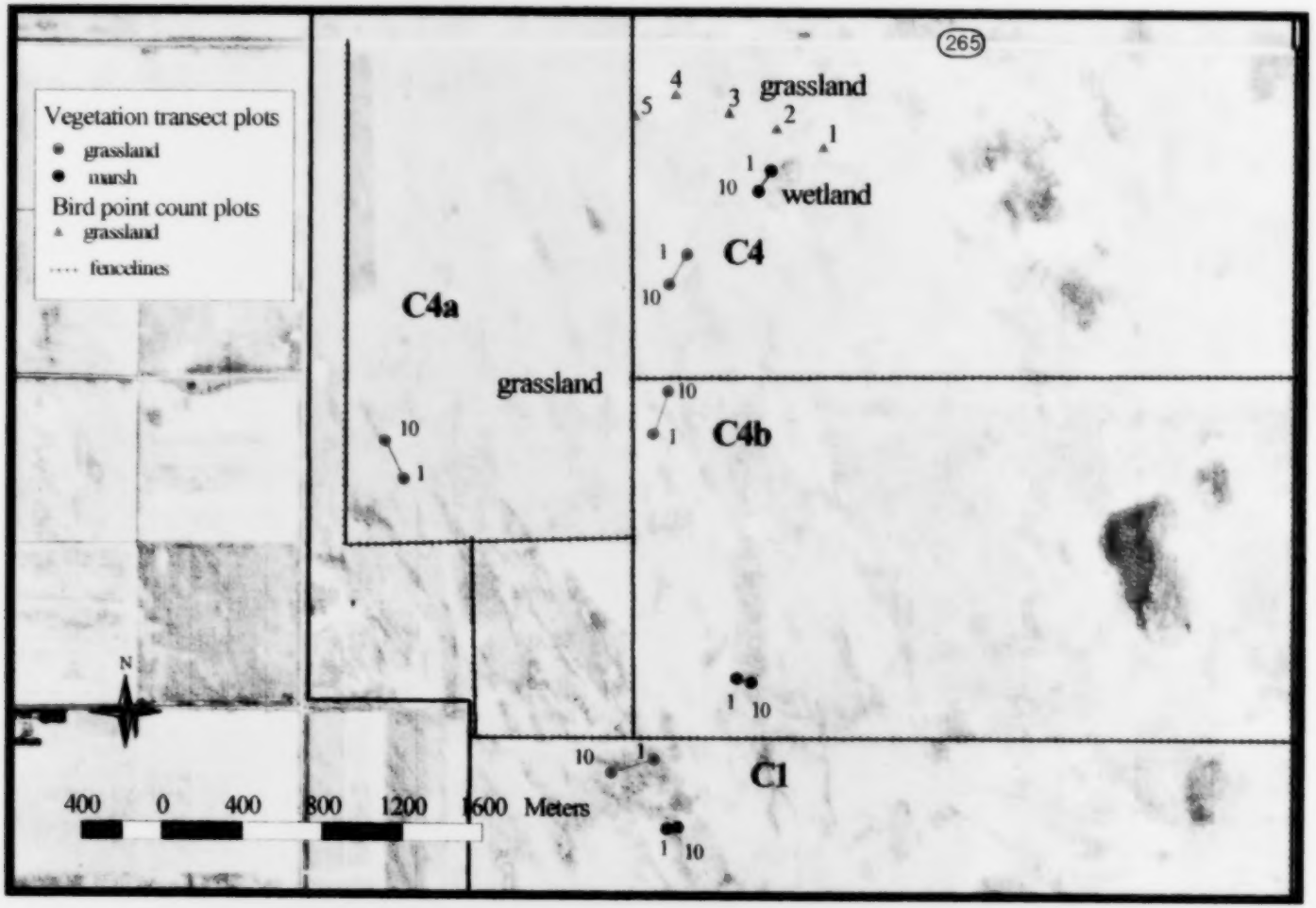

Figure 9. Vegetation plots (showing first and last plot for each line transect) and bird transect plots in fields C1, C4, C4a, and C4b.

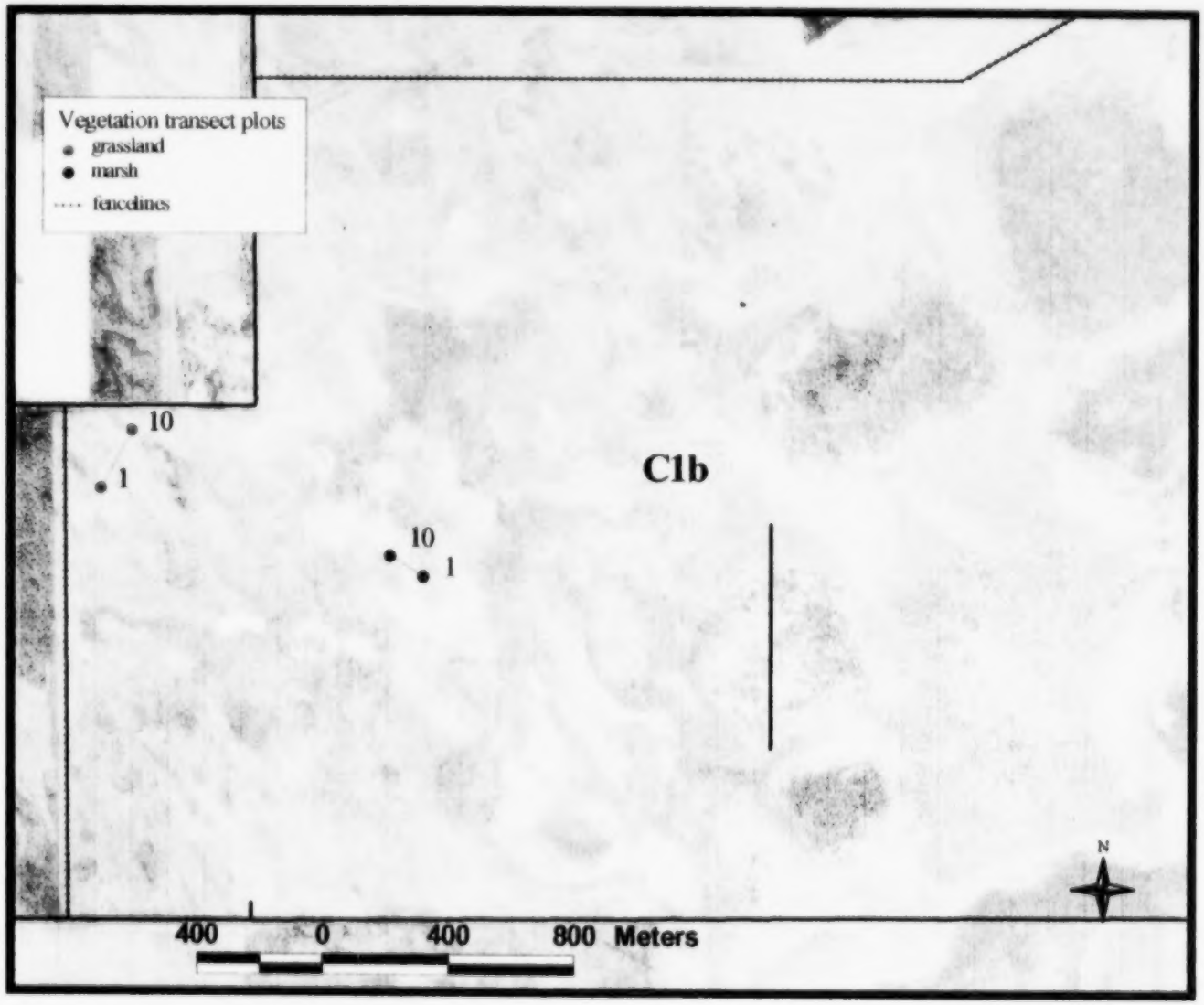

Figure 10. Vegetation transect plots (showing first and last plot of each line transect) in field C1b.

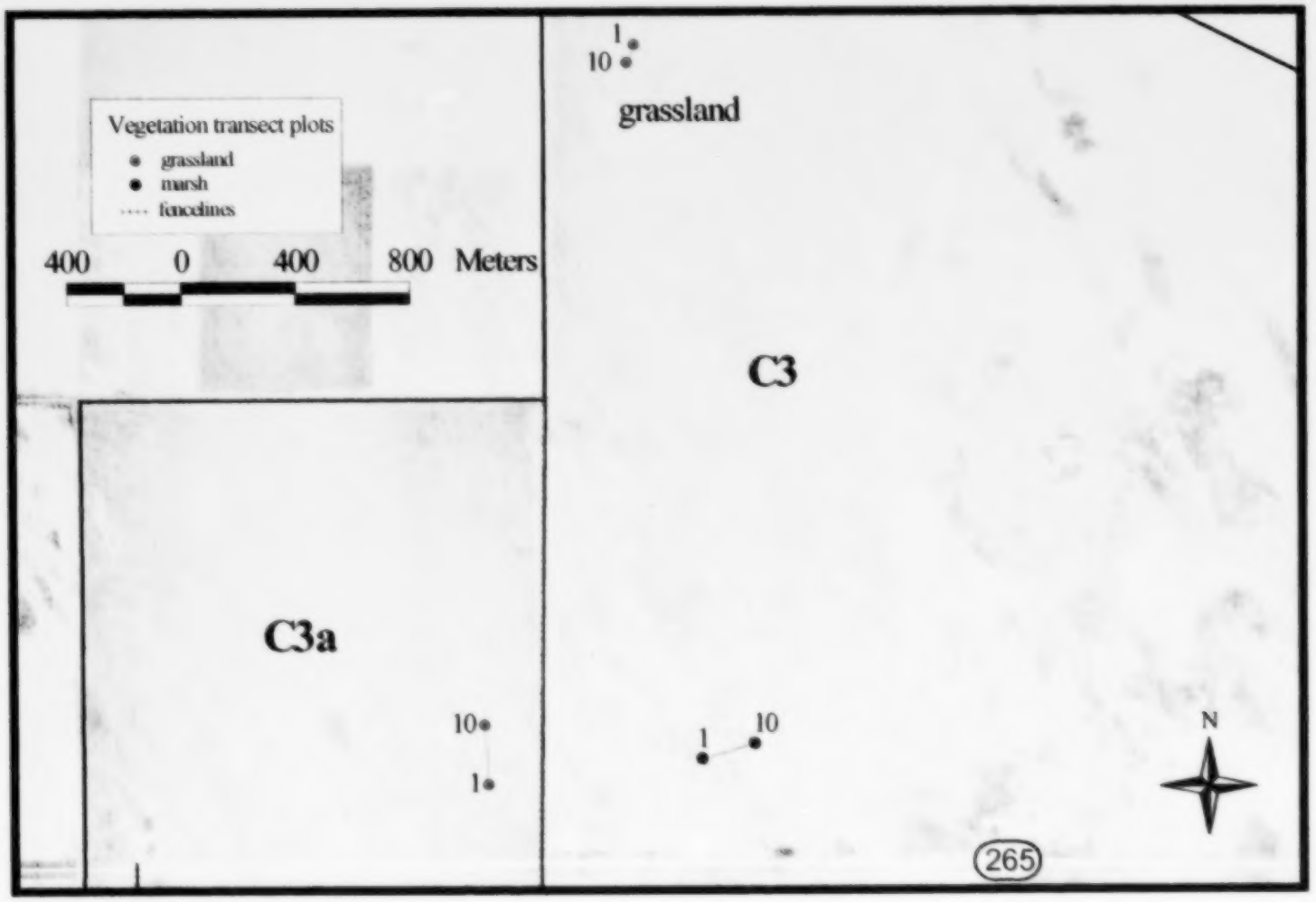

Figure 11. Vegetation transect plots (showing first and last plot of each line transect) in fields C3a and C3.

Appendix X

Plant species with authority, family, study area(s), habitat type(s), and flowering dates for the Lakeview and Westbourne Community Pastures.

* indicates a non-native species
Gr = species recorded in grassland habitat
We = species recorded in wetland habitat
De = species recorded in aspen woodland habitat
X = species recbrded in flower that month
Fr = species recorded in fruit that month

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Acer negundo L.	Manitoba maple	Aceraceae			De					
Achillea millefolium L. *	common yarrow	Asteraceae	Gr		De	Gr		X	X	X
Actaea rubra (Ait.) Willd.	red baneberry	Ranunculaceae			De					
Agalinis tenuifolia Vahl	slender agalinis	Scrophulariaceae	Gr						X	
Agoseris glauca (Pursh) Raf.	false dandelion	Asteraceae	Gr		De				X	X
Agropyron elongatum (Host) Beauv.	tall wheatgrass	Poaceae				Gr				
Agropyron repens (L.) Beauv.*	quack grass	Poaceae	Gr	We	De	Gr	We			
Agropyron smithii Rydb.	western wheatgrass	Poaceae	Gr			Gr				
Agropyron sp. (unidentified)	wheatgrass (unidentified)	Poaceae			De					
Agropyron trachycaulum (Link) Malte	slender wheatgrass	Poaceae	Gr			Gr				
Agropyron trachycaulum (Link) Malte var. *unilaterale* (Cass.) Malte	awned wheatgrass	Poaceae	Gr		De	Gr				
Agrostis hyemalis (Walt.) B.S.P.	tickle-grass	Poaceae	Gr		De	Gr				
Agrostis stolonifera L.*	redtop	Poaceae	Gr		De	Gr				
Alisma plantago-aquatica L.	common water plantain	Alismataceae		We			We	X	X	
Allium stellatum Nutt. *ex* Ker-Gawl.	pink-flowered onion	Liliaceae	Gr						X	X
Ambrosia psilostachya DC	perennial ragweed	Asteraceae	Gr	We		Gr				

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Amelanchier alnifolia (Nutt.) Nutt. *ex* M. Roemer	saskatoon	Rosaceae	Gr		De					Fr
Andropogon gerardii Vitman	big bluestem	Poaceae	Gr		De					
Andropogon scoparius Michx.	little bluestem	Poaceae	Gr		De					
Androsace septentrionalis L.	pygmyflower	Primulaceae	Gr							
Anemone canadensis L.	Canada anemone	Ranunculaceae			De					
Anemone cylindrica Gray	thimbleweed	Ranunculaceae	Gr		De	Gr				Fr
Anenome patens L.	prairie crocus	Ranunculaceae	Gr							
Antennaria parvifolia Nutt.	small-leaved everlasting	Asteraceae	Gr		De	Gr				
Antennaria spp (unidentified)	everlasting (unidentified)	Asteraceae	Gr		De	Gr				
Apocynum androsaemifolium L.	spreading dogbane	Apocynaceae			De					
Apocynum cannabinum L.	Indian hemp	Apocynaceae	Gr	We						
Aralia nudicaulis L.	wild sarsaparilla	Araliaceae			De					
Arctium lappa L.	great burdock	Asteraceae			De					
Arctostaphylos uva-ursi (L.) Spreng	alpine bearberry	Ericaceae			De					Fr
Artemisia campestris L.	plains wormwood	Asteraceae				Gr				
Artemisia frigida Willd.	pasture sage	Asteraceae	Gr			Gr				X
Artemisia ludoviciana Nutt.	prairie sage	Asteraceae	Gr							
Asclepias ovalifolia Dcne.	dwarf milkweed	Asclepiaceae	Gr							
Asclepias speciosa Torr.	showy milkweed	Asclepiaceae	Gr			Gr			X	
Aster ciliolatus Lindl.	Lindley's aster	Asteraceae			De					
Aster ericoides L.	many-flowered aster	Asteraceae	Gr	We	De	Gr			X	X
Aster junciformis Rydb.	rush aster	Asteraceae	Gr	We		Gr	We			X
Aster laevis L.	smooth aster	Asteraceae	Gr		De				X	X
Aster lateriflorus (L.) Britt.	wood aster	Asteraceae			De					
Aster novae-angliae L.	New England aster	Asteraceae	Gr						X	X
Aster ptarmicoides (Nees) Torr. & Gray	white upland aster	Asteraceae	Gr						X	X
Aster sp. (unidentified)	aster (unidentified)	Asteraceae			De					

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Astragalus danicus Retz.		Fabaceae	Gr							
Astragalus sp. (unidentified)	milkvetch (unidentified)	Fabaceae	Gr			Gr				
Beckmannia syzigachne (Steud.) Fern.	slough grass	Poaceae				Gr	We			
Betula pumila L.	swamp birch	Betulaceae	Gr	We	De					
Bouteloua gracilis (Willd. *ex* Kunth) Lag. *ex* Griffiths	blue grama	Poaceae	Gr							
Brassica sp. (unidentified)	mustard (unidentified)	Brassicaceae				Gr				
Bromus ciliatus L.	fringed brome	Poaceae			De					
Bromus inermis Leyss.*	smooth brome	Poaceae			De	Gr				
Calamagrostis canadensis (Michx.) Beauv.	marsh reed grass	Poaceae		We		Gr	We			
Calamagrostis inexpansa Gray	northern reed grass	Poaceae	Gr	We	De	Gr				
Calamagrostis sp. (unidentified)	reed grass (unidentified)	Poaceae	Gr	We	De	Gr	We			
Campanula rotundifolia L.	harebell	Campanulaceae	Gr		De	Gr				
Carex aquatilis Wahl.	water sedge	Cyperaceae		We						
Carex aurea Nutt.	golden sedge	Cyperaceae	Gr			Gr				Fr
Carex crawei Dewey	Crawe's sedge	Cyperaceae	Gr	We						
Carex laeviconica Dewey	smooth-fruited sedge	Cyperaceae		We			We			
Carex lanuginosa Michx.	woolly sedge	Cyperaceae				Gr	We			
Carex lasiocarpa Ehrh.	hairy-fruited sedge	Cyperaceae		We			We			
Carex parryana Dewey	Parry's sedge	Cyperaceae		We			We			
Carex praegracilis W. Boott	graceful sedge	Cyperaceae				Gr				
Carex sp. (unidentified)	sedge (unidentified)	Cyperaceae	Gr	We	De	Gr	We			
Carex tetanica Schkuhr	rigid sedge	Cyperaceae		We						
Carex utriculata W. Boott	bottle sedge	Cyperaceae	Gr	We			We			
Castilleja miniata Dougl. ex Hook.	red painted-cup	Scrophulariaceae			De				X	
Chenopodium album L. *	lamb's quarters	Chenopodiaceae	Gr				We			
Cirsium arvense (L.) Scop.*	Canada thistle	Asteraceae	Gr	We		Gr		X	X	X
Cirsium flodmanii (Rydb.) Arthur	Flodman's thistle	Asteraceae	Gr	We		Gr			X	X

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Cirsium sp.(unidentified)	thistle (unidentified)	Asteraceae	Gr	We	De	Gr		X	X	
Comandra umbellata (L.) Nutt.	bastard toadflax	Santaliaceae	Gr							
Cornus stolonifera Michx.	red-osier dogwood	Cornaceae			De					Fr
Crateagus sp. (unidentified)	hawthorn (unidentified)	Rosaceae			De					
Crepis tectorum L.*	narrow-leaved hawks-beard	Asteraceae	Gr	We		Gr				
Dalea candida Willd.	white prairie-clover	Fabaceae	Gr		De				X	X
Dalea purpurea Vent.	purple prairie-clover	Fabaceae	Gr						X	X
Distichlis stricta (Torr.) Rydb.	alkali grass	Poaceae	Gr			Gr				
Elaeagnus commutata Bernh. *ex* Rydb.	wolf-willow	Elaeagnaceae	Gr		De			X		Fr
Eleocharis elliptica Kunth	slender spike rush	Cyperaceae					We			
Eleocharis smallii Britt.	Small's spike rush	Cyperaceae					We			
F (unidentified)	spike rush (unidentified)	Cyperaceae	Gr	We		Gr	We			
Elymus canadensis L.	Canada wild rye	Poaceae			De					
Equisetum sp. (unidentified)	horse tail (unidentified)	Equisetaceae			De					
Erigeron asper Nutt.	rough fleabane		Gr							
Erigeron lonchophyllus Hook.	hirsute fleabane	Asteraceae	Gr			Gr				
Erigeron philadelphicus L.	Philadelphia fleabane	Asteraceae	Gr		De					
Erigeron sp. (unidentified)	fleabane (unidentified)	Asteraceae	Gr							
Eriophorum sp. (unidentified)	cotton-grass (unidentified)	Cyperaceae	Gr							
Euphorbia esula L.*	leafy spurge	Euphorbiaceae	Gr							
Festuca eliator L.	meadow fescue	Poaceae				Gr				
Fragaria virginiana Duchesne	smooth wild strawberry	Rosaceae			De					
Galium boreale L.	northern bedstraw	Rubiaceae	Gr	We	De				X	X
Gaillardia aristata Pursh	great-flowered gaillardia	Asteraceae	Gr					X		
Gentiana affinis Griseb.	oblong-leaved gentian	Gentianaceae	Gr						X	
Gentianella amarella (L.) Boerner	felwort	Gentianaceae	Gr							X

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Gentiana andrewsii Griseb.	bottle gentian	Gentianaceae	Gr							X
Gentiana linearis Froel.	narrow-leaved gentian	Gentianaceae	Gr						X	
Gentiana sp. (unidentified)	gentian (unidentified)	Gentianaceae	Gr							
Geum triflorum Pursh	three-flowered avens	Rosaceae	Gr							
Glaux maritima L.	sea-milkwort	Primulaceae				Gr	We			
Glycyrrhiza lepidota Pursh	wild licorice	Leguminaceae	Gr		De	Gr				Fr
Grindelia squarrosa (Pursh) Dunal	curly-cup gumweed	Asteraceae	Gr	We		Gr				
Helianthus laetiflorus Pers.	beautiful sunflower	Asteraceae	Gr						X	X
Helianthus maximiliani Schrad.	narrow-leaved sunflower	Asteraceae	Gr							X
Helianthus sp. (unidentified)	sunflower (unidentified)	Asteraceae	Gr							
Helictotrichon hookeri (Scribn.) Henr.	Hooker's oat grass	Poaceae	Gr							
Heuchera richardsonii R. Br.	alumroot	Saxifragaceae	Gr		De					
Hieracium canadense Michx.	Canada hawkweed	Asteraceae			De				X	X
Hieracium sp. (unidentified)	hawkweed (unidentified)	Asteraceae			De					X
Hordeum jubatum L.	foxtail barley	Poaceae	Gr	We		Gr	We			
Hypoxis hirsuta (L.) Coville	yellow stargrass	Liliaceae	Gr					X		
Juncus balticus Willd.	baltic rush	Juncaceae	Gr	We	De	Gr		X		
Juncus longistylis Torr.	long-styled rush	Juncaceae	Gr			Gr				
Juncus sp. (unidentified)	rush (unidentified)	Juncaceae	Gr	We	De	Gr	We			
Juncus sp. (small star, unidentified)	rush (unidentified)	Juncaceae		We		Gr	We			
Juncus torreyi Coville	Torrey's rush	Juncaceae	Gr	We		Gr				
Koeleria cristata (L.) Pers	June grass	Poaceae	Gr			Gr				
Lactuca tatarica (L.) C.A. Mey.	wild lettuce	Asteraceae				Gr				
Lactuca sp. (unidentified)	lettuce (unidentified)	Asteraceae	Gr							
Lathyrus ochroleucus Hook.	pale vetchling	Fabaceae			De			X		
Lathyrus sp. (unidentified)	vetchling (unidentified)	Fabaceae			De					
Lemna minor L.	lesser duckweed	Lemnaceae					We			
Lepidium densiflorum Schrad	common pepper-grass	Brassicaceae	Gr			Gr				
Liatris ligulistylis (A. Nels.) K. Schum.	meadow blazingstar	Asteraceae	Gr					X	X	X

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Lilium philadelphicum L.	wood lily	Liliaceae			De					
Linum lewisii Pursh	blue flax	Linaceae	Gr						X	
Lithospermum canescens (Michx.) Lehm.	hoary puccoon	Boraginaceae	Gr		De			X		
Lobelia kalmii L.	Kalm's lobelia	Campanulaceae	Gr							
Lobelia spicata Lam.	pale-spike lobelia	Campanulaceae	Gr						X	X
Lonicera dioica L.	twining honeysuckle	Caprifoliaceae	Gr		De					
Lotus corniculatus L.*	bird's-foot trefoil	Fabaceae	Gr							X
Lycopus asper Greene	northern bugle-weed	Lamiaceae	Gr	We		Gr	We			
Lysimachia ciliata L.	fringed loosestrife	Primulaceae			De					
Maianthemum canadense Desf.	two-leaved solomon's-seal	Liliaceae			De					
Medicago lupulina L.*	black medick	Fabaceae	Gr		De	Gr			X	X
Melilotus alba Desr.	white sweet clover	Fabaceae	Gr		De	Gr				
Melilotus officinalis (L.) Lam	yellow sweet clover	Fabaceae	Gr		De	Gr				
Mentha arvensis L.	common mint	Lamiaceae		We		Gr	We			
Monarda fistulosa L.	wild bergamot	Lamiaceae			De					
Muhlenbergia asperifolia (Nees & Meyer ex Trin) Parodi	scratch grass	Poaceae	Gr	We		Gr	We			
Muhlenbergia cuspidata (Torr. ex Hook.) Rydb.	prairie muhly	Poaceae	Gr		De					
Muhlenbergia glomerata (Willd.) Trin.	bog muhly	Poaceae			De					
Muhlenbergia racemosa (Michx.) B.S.P.	marsh muhly	Poaceae			De					
Muhlenbergia richardsonis (Trin.) Rydb.	mat muhly	Poaceae	Gr							
Oenothera biennis L.	evening-primrose	Onagraceae			De	Gr				Fr
Orthocarpus luteus Nutt.	owl's-clover	Scrophulaceae	Gr					X	X	X
Oryzopsis asperifolia Michx.	white-grained mountain grass	Poaceae			De					

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Panicum leibergii (Vasey) Scribn.	Leiberg's panic grass	Poaceae			De					
Panicum virgatum L.	switch grass	Poaceae	Gr		De					
Pedicularis canadensis L.	wood betony	Scrophulaceae	Gr		De					X
Pedicularis lanceolata Michx.	swamp lousewort	Scrophulaceae	Gr							X
Penstemon gracilis Nutt.	lilac-flowered beard-tongue	Scrophulaceae	Gr						Fr	Fr
Penstemon sp. (unidentified)	beard-tongue (unidentified)	Scrophulaceae	Gr							Fr
Petasites palmatus (Ait.) Gray	palmate-leaved colt's-foot	Asteraceae			De					
Petasites sagittatus (Pursh) A. Gray	arrow-leaved colt's-foot	Asteraceae					We			
Phalaris arundinacea L.	reed canary grass	Poaceae		We		Gr	We			
Phleum pratense L.	common timothy	Poaceae				Gr				
Picea glauca (Moench) Voss	white spruce	Pinaceae	Gr							
Platanthera hyperborea (L.) Lindl.	bog orchis	Orchidaceae			De					
Plantago eriopoda Torr.	saline plantain	Plantaginaceae	Gr	We		Gr				
Plantago major L.	common plantain	Plantaginaceae	Gr							
Plantago sp. (unidentified)	plantain (unidentified)	Plantaginaceae	Gr		De	Gr				
Poa compressa L.*	Canada bluegrass	Poaceae	Gr			Gr				
Poa palustris L.	fowl bluegrass	Poaceae		We		Gr	We			
Poa pratensis L.	Kentucky bluegrass	Poaceae	Gr		De	Gr				
Poa sp. (unidentified)	bluegrass (unidentified)	Poaceae		We	De	Gr				
Polygala senega L.	Seneca snakeroot	Polygalaceae	Gr		De				X	
Polygala verticillata L.	whorled milkwort	Polygalaceae	Gr						X	
Polygonum amphibium L.	water smartweed	Polygonaceae	Gr	We		Gr				
Polygonum sp. (unidentified)	knotweed (unidentified)	Polygonaceae		We		Gr	We			
Populus balsamifera L.	balsam poplar	Salicaceae	Gr		De					
Populus tremuloides Michx.	trembling aspen	Salicaceae	Gr		De					
Potentilla anserina L.	silverweed	Rosaceae	Gr	We		Gr	We	X	X	X
Potentilla argentea L.*	silvery cinquefoil	Rosaceae	Gr					X		

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Potentilla fruticosa (Pursh) A. Love	shrubby cinquefoil	Rosaceae	Gr		De	Gr			X	X
Potentilla norvegica L.	rough cinquefoil	Rosaceae	Gr							
Potentilla pensylvanica L.	cinquefoil	Rosaceae	Gr			Gr				
Potentilla sp. (unidentified)	cinquefoil (unidentified)	Rosaceae				Gr				
Prenanthes alba L.	white lettuce	Asteraceae			De					X
Prunella vulgaris L.	heal-all	Lamiaceae	Gr		De					
Prunus pensylvanica L.f.	pin cherry	Rosaceae			De					
Prunus virginiana L.	choke cherry	Rosaceae			De					
Psoralea argophylla Pursh	silverleaf psoralea	Fabaceae	Gr							
Psoralea esculenta Nutt.	Indian breadroot	Fabaceae	Gr						X	X
Puccinellia nuttalliana (Schultes) Hitchc.		Poaceae	Gr		De	Gr				
Pyrola sp. (unidentified)	pyrola (unidentified)	Pyrolaceae			De					
Quercus macrocarpa Michx.	bur oak	Fagaceae			De					
Ranunculus cymbalaria Pursh	seaside crowfoot	Ranunculaceae	Gr			Gr	We		X	X
Ranunculus pensylvanicus L.	bristly crowfoot	Ranunculaceae					We		X	
Ranunculus sceleratus L.	cursed crowfoot	Ranunculaceae					We		X	
Ranunculus sp. (unidentified)	buttercup (unidentified)	Ranunculaceae	Gr			Gr	We			
Rhus radicans L.	poison-ivy	Anacardiaceae			De					
Ribes oxycanthoides L.	bristly wild gooseberry	Grossulariaceae			De					
Ribes sp. (unidentified)	gooseberry (unidentified)	Grossulariaceae			De					
Rosa sp. (unidentified)	rose (unidentified)	Rosaceae	Gr	We	De	Gr				
Rubus idaeus L.	wild red raspberry	Rosaceae			De					
Rubus pubescens Raf.	dewberry	Rosaceae	Gr		De					
Rudbeckia hirta L.*	black-eyed susan	Asteraceae	Gr		De			X	X	X
Rumex sp. (unidentified)	dock (unidentified)	Polygonaceae				Gr	We			
Salix spp. (unidentified)	willow (unidentified)	Salicaceae	Gr	We	De	Gr	We			
Sanicula marilandica L.	snakeroot	Apiaceae			De					

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Schizachne purpurascens (Torr.) Swallen	purple oat grass	Poaceae			De					
Scirpus pallidus (Britt.) Fern	pale bulrush	Juncaceae					We			
Scirpus sp. (unidentified)	bulrush (unidentified)	Juncaceae	Gr							
Scirpus validus Vahl	common great bulrush	Juncaceae		We			We			
Senecio sp. (unidentified)	ragwort (unidentified)	Asteraceae	Gr							
Shepherdia canadensis (L.) Nutt.	Canada buffaloberry	Elaeagnaceae	Gr		De					
Sisyrinchium montanum Greene	common blue-eyed grass	Iridaceae	Gr					X	X	
Sium suave Walt.	water-parsnip	Apiaceae		We			We			
Smilacina stellata (L.) Desf.	star-flowered solomon's-seal	Liliaceae	Gr		De					
Smilax lasioneura Hook.	carrion-flower	Smilacaceae			De					
Solidago canadensis L.	Canada goldenrod	Asteraceae	Gr	We	De	Gr				
Solidago graminifolia (L.) Salisb.	flat-topped goldenrod	Asteraceae	Gr							
Solidago missouriensis Nutt.	low goldenrod	Asteraceae	Gr							X
Solidago rigida L.	stiff goldenrod	Asteraceae	Gr			Gr				X
Solidago sp. (unidentified)	goldenrod (unidentified)	Asteraceae	Gr	We	De	Gr				
Solidago riddellii Frank *ex* Riddell	Riddell's goldenrod	Asteraceae	Gr							
Solidago spathulata DC.	mountain goldenrod	Asteraceae	Gr			Gr			X	X
Sonchus arvensis L.	field sow-thistle	Asteraceae	Gr							
Sonchus sp. (unidentified)	sow-thistle (unidentified)	Asteraceae	Gr			Gr				
Sparganium eurycarpum Engelm. ex Gray	broad-fruited bur-reed	Sparganiaceae					We			
Spartina gracilis Trin.	alkali cord grass	Poaceae	Gr	We						
Spartina pectinata Link	slough grass	Poaceae	Gr	We						
Spiranthes romanzoffiana Cham.	hooded ladies'-tresses	Orchidaceae	Gr							
Spirea alba Du Roi	meadowsweet	Rosaceae	Gr							
Sporobolus heterolepis (Gray) Gray	prairie dropseed	Poaceae	Gr							
Stachys palustris L.	woundwort	Lamiaceae	Gr	We	De	Gr	We			

Scientific name	Common name	Family	Lakeview			Westbourne		Phenology		
			Grass	Wet	Forest	Grass	Wet	June	July	Aug
Stipa sp. (unidentified)	spear grass (unidentified)	Poaceae				Gr				
Stipa spartea Trin.	porcupine grass	Poaceae	Gr							
Stipa viridula Trin.	green needle grass	Poaceae	Gr							
Symphoricarpos occidentalis Hook.	western snowberry	Caprifoliaceae	Gr	We	De	Gr			Fr	Fr
Taraxacum officinale G.H. Weber *ex* Wiggers	common dandelion	Asteraceae	Gr	We	De	Gr		X	X	X
Thalictrum dasycarpum Fisch. & Ave-Lall.	tall meadow-rue	Ranunculaceae			De			X		
Thalictrum venulosum Trel.	veiny meadow-rue	Ranunculaceae	Gr		De					
Trifolium pratense L.*	red clover	Fabaceae			De					
Trifolium repens L.*	white clover	Fabaceae	Gr		De	Gr				
Trifolium hybridum L.*	alsike clover	Fabaceae				Gr				
Triglochin maritima L.	seaside arrow-grass	Jucaginaceae	Gr	We		Gr	We		Fr	Fr
Typha angustifolia L.	narrow-leaved cat-tail	Typhaceae		We						
Typha latifolia L.	common cat-tail	Typhaceae		We						
Ulmus americana L.	American elm	Ulmaceae	Gr							
Utricularia vulgaris L.	greater bladderwort	Lentibulariaceae		We			We	X	X	
Vicia americana Muhl. ex Willd.	common vetch	Fabaceae			De					
Viola canadensis L. var. *rugulosa* (Greene) C.L. Hitchc.	Canada violet	Violaceae			De					
Viola pedatifida G. Don	purple prairie violet	Violaceae	Gr							
Viola sp. (unidentified)	violet (unidentified)	Violaceae	Gr		De	Gr				
Zigandenus elegans Pursh	white camas	Liliaceae	Gr							
Zizia aptera (Gray) Fern.	heart-leaved alexanders	Apiaceae	Gr		De					Fr
Zizia aurea (L.) W.D.J. Koch	golden alexanders	Apiaceae			De					

Appendix XI

Bird species including common names, scientific names, study area(s) and habitat type(s) observed in the Lakeview and Westbourne Community Pastures.

Gr = species recorded in grassland habitat

We = species recorded in wetland habitat

De = species recorded in aspen woodland habitat

Common Name	Scientific Name	Lakeview			Westbourne	
		Grass	Wet	Forest	Grass	Wet
Alder flycatcher	*Empidonax alnorum*			De		
American bittern	*Botaurus lentiginosus*		We			We
American coot	*Fulica ameriana*	Gr	We		Gr	We
American crow	*Corvus brachyrhynchos*	Gr	We	De		
American goldfinch	*Carduelis pinus*	Gr				
American redstart	*Setophaga ruticilla*			De		
American robin	*Turdus migratorius*		We	De		
American white pelican	*Pelecanus erythrorhynchos*	Gr	We		Gr	We
Bald eagle	*Haliaeetus leucocephalus*	Gr		De		
Barn swallow	*Hirundo rustica*	Gr	We			
Black-billed cuckoo	*Coccyzus erythropthalmus*	Gr	We			
Black-capped chickadee	*Poecile atricapillus*			De		
Black-crowned night-heron	*Nycticorax nycticorax*		We			We
Black tern	*Chlidonias niger*	Gr	We			We
Blue jay	*Cyanocitta cristata*			De		
Blue-winged teal	*Anas discors*	Gr	We		Gr	We
Bobolink	*Dolichonyx oryzivorus*	Gr	We		Gr	
Brown thrasher	*Toxostoma rufum*	Gr				
Brown-headed cowbird	*Molothrus ater*				Gr	
Canada goose	*Branta canadensis*		We			We
Cedar waxwing	*Bombycilla cedrorum*		We			
Chestnut-sided warbler	*Dendroica pensylvanica*			De		
Clay-coloured sparrow	*Spizella pallida*	Gr	We	De	Gr	We
Cliff swallow	*Petrochelidon pyrrhonota*		We			
Common grackle	*Quiscalus quiscula*	Gr				
Common raven	*Corvus corax*			De		
Common snipe	*Gallinago gallinago*	Gr	We	De	Gr	
Common yellowthroat	*Geothlypis trichas*		We			We
Downy woodpecker	*Picoides pubescens*			De		
Eastern bluebird	*Sialia sialis*	Gr				
Eastern kingbird	*Tyrannus tyrannus*	Gr		De		
Eastern towhee	*Pipilo erythrophthalmus*			De		
Eastern wood-peewee	*Contopus virens*			De		
Forster's tern	*Sterna forsteri*		We			We
Franklin's gull	*Larus atricilla*	Gr	We		Gr	
Grey catbird	*Dumetella carolinensis*	Gr	We	De		
Hermit thrush	*Catharus guttatus*			De		

House wren	*Troglodytes aedon*			De		
Killdeer	*Charadrius vociferus*	Gr	We		Gr	
Least flycatcher	*Empidonax minimus*	Gr	We	De		
Lesser yellow legs	*Tringa flavipes*		We			We
Mallard	*Anas platyrhynchos*	Gr	We	De		
Marbled godwit	*Limosa fedoa*	Gr	We			
Marsh wren	*Cistothorus palustris*		We		Gr	We
Mountain bluebird	*Sialia currucoides*	Gr				
Mourning dove	*Zenaida macroura*	Gr	We	De		
Nelson's sharp-tailed sparrow	*Ammodramus nelsoni*		We		Gr	We
Northern harrier	*Circus cyaneus*		We		Gr	We
Northern oriole	*Icterus galbula*			De		
Northern shoveller	*Anas clypeata*		We			
Ovenbird	*Seiurus aurocapillus*			De		
Peregrine falcon	*Falco peregrinus*	Gr				
Pied-billed grebe	*Podilymbus podiceps*		We			
Northern pintail	*Anas acuta*				Gr	We
Red-eyed vireo	*Vireo olivaceus*		We	De		
Red-tailed hawk	*Buteo jamaicensis*		We	De		
Red-winged blackbird	*Agelaius phoeniceus*	Gr	We	De	Gr	We
Ring-billed gull	*Larus delawarensis*	Gr	We		Gr	We
Rose-breasted grosbeak	*Pheucticus ludovicianus*			De		
Ruffed grouse (with brood)	*Bonasa umbellus*			De		
Sandhill crane	*Grus canadensis*		We		Gr	We
Savannah sparrow	*Passerculus sandwichensis*	Gr	We		Gr	We
Sedge wren	*Cistothorus platensis*	Gr	We	De	Gr	We
Short-eared owl	*Asio flammeus*				Gr	We
Song sparrow	*Melospiza melodia*	Gr	We	De	Gr	We
Sora	*Porzana carolina*	Gr	We		Gr	We
Swamp sparrow	*Melospiza georgiana*		We			
Tree swallow	*Tachycineta bicolor*		We			
Trumpeter swan	*Cygnus buccinator*				Gr	We
Upland sandpiper	*Bartramia longicauda*	Gr			Gr	
Veery	*Catharus fuscescens*		We	De		
Vesper sparrow	*Pooecetes gramineus*	Gr			Gr	
Warbling vireo	*Vireo gilvus*	Gr	We	De		
Western kingbird	*Tyrannus verticalis*	Gr		De		
Western meadowlark	*Sturnella neglecta*	Gr	We		Gr	We
White-throated sparrow	*Zonotrichia albicollis*		We	De		
Willet	*Catoptrophorus semipalmatus*				Gr	
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*		We	De		
Yellow rail	*Coturnicops noveboracensis*				Gr	
Yellow-shafted flicker	*Colaptes auratus*					
Yellow warbler	*Dendroica petechia*	Gr		De		